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TREATMENT OF THE COMMONER DISEASES

By LEWELLYS F. BARKER, M.D.
Professor Emeritus of Medicine, Johns Hopkins University

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FOREWORD

WITH the beginning of the new year and, likewise, of a new volume, the Editorial Board of the *Journal* desires to extend to the membership of our Association its heartfelt good wishes for a Happy and Prosperous New Year.

Because of a straitened financial position the *Journal* has been slightly limited in size as compared with former years. However, we believe that this is only a trifling detriment, more than counterbalanced by an improvement in quality and scope. We are confident that the forthcoming issues will be better than ever before.

Burning questions have always commanded our attention and will continue to do so. Among these are the economic situation as it affects the profession and the control of cancer.

We have arranged for a Section of Medical Economics, under which will appear statements as to the situation in the various provinces of the Dominion and the action that has been taken thereon or is contemplated by organized medicine and various public bodies, as well as articles bringing forward constructive ideas. Things are moving fast in certain of our western provinces and we are glad to see that the medical profession is becoming increasingly alive to the situation and that their representations are meeting with some approval. Let us present a united front, through our Association and through our *Journal*. Only in this way can we achieve our end — a fair deal for the patient and a fair deal for the doctor. A committee of the Association has been studying this question and, we understand, is on the eve of making some important recommendations.

The control of cancer is also occupying our attention. It is a truism to say that, lacking a specific cure, the control of cancer depends on early diagnosis and the prompt application of those remedial measures which have been shown to be effective. Nevertheless, the statement will stand repetition. The crux of the situation lies in the education of the general public and the re-education of the medical practitioner. For the benefit of the latter the *Journal* is publishing a series of short articles on the early diagnosis of cancer, intended to refresh the memory. The Committee of the Association on Publicity and Health Education will shortly issue a series of brochures on health topics, for the benefit of the public, the first of which will be devoted to cancer. The Executive of the Association has endorsed the principle of establishing a Canadian Society for the Control of Cancer, and more will be heard about this later in the *Journal*. We are moving.

The section of the *Journal* devoted to abstracts will be improved. Not that it will be increased in size for the present, but its scope will be widened, so that the whole of medicine will be covered, and more attention will be paid to foreign journals.

A feature of much practical importance will be the publication from time to time of short notes on the British Pharmacopœia and Canadian Formulary, prepared by Drs. V. E. Henderson and G. H. W. Lucas, of Toronto, which should be helpful to everybody.

More attention will be paid to Military Medicine. In the event of war the central military authorities, as before, would have to call upon the medical profession at large to provide the medical service. Let us see to it that we are adequately prepared for this duty. It is in time of peace that we should prepare for war. At the outbreak of the Great War the medical profession rose nobly to the occasion, but it was a wild scramble for a time. We look to those specially qualified to provide us with material for publication.

Finally, some hints looking to the betterment of the *Journal*. The secretaries of provincial medical societies could help by sending us judiciously pruned and edited reports of their societies' activities, dealing with major subjects; and individual members could send us news, items of medical history, biographical sketches, case reports, questions and answers, and articles. It is *your Journal*.

A.G.N.

SOME UNUSUAL MANIFESTATIONS OF TUBERCULOSIS*

BY SIR HUMPHRY ROLLESTON, BART., G.C.V.O., K.C.B., M.D.,

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I PROPOSE to touch on some aspects of tuberculosis not absolutely commonplace, and to begin, though their relevance may not be obvious, at any rate at first, with some remarks on the nomenclature connected with tuberculosis.

Tubercle (diminutive of *tuber*) is used in two senses: (1) anatomically or morphologically, meaning a knob, as in the tubercle of the tibia, Lower's tubercle in the right auricle of the heart, and Farre's tubercles, an obsolete name for secondary malignant nodules on the surface of the liver. It was first thus used in English in connection with "the bones of the larinx" in the quaintly entitled book "The Historie of Man, sucked from the Sappe of the most approved Anathomistes, in the present age, compiled in most compendious fourme for the vtilitie of all godly Chirurgians within the Realme, by John Banister, Master in Chirurgerie and Practitioner in Phisicke," London, 1578; (2) as a specific term for the granulomas known since 1882 to be due to the activity of the tubercle bacillus; it was first used somewhat in this sense in 1661 by Robert Lovell (obiit 1690) of Christ Church, Oxford, who in his polysyllabic treatise *Panzoologicomineralogia or a compleat History of Animals and Minerals,* which included an account of "sympathic" and "antipathic" diseases, wrote "The tubercles of the lungs are caused by afflux or congestion of matter; they are cured by evacuation and agglutination." In 1889, in view of the confusion likely to arise from the employment of the word in these two senses, a committee of the old Pathological Society of London (merged in 1907 in the Royal Society of Medicine as its Pathological Section), recommended that all lesions having the form of "tubercles" should instead be called "nodules", with an adjective attached to show that they were due to tuberculosis, glanders, aspergillosis, blastomycosis or other causes.

Tuberculous, now properly employed for lesions due to the activity of the tubercle bacillus, dates back to 1747; *tubercular,* with an anatomical and morphological connotation, as survives in tubercular leprosy and tubercular syphilides, appears to be more recent, the earliest quotation in the Oxford Dictionary bearing the date 1799; although commonly employed as synonymous with tuberculous it would more suitably be restricted to nodular lesions due to causes other than the tubercle bacillus, but this is probably a counsel of perfection.

The word "tuberculosis", now confined to the products of the tubercle bacillus, apparently did not appear in English until 1860. Phthisis, an umbrella-like word covering wasting diseases of various origins, dates from ancient Greek and Latin times, and should not have a more specialized meaning than cachexia.

"Paratuberculosis" has unfortunately been used in more than one sense. In Dorland's Dictionary (9th edition, 1917) it is defined as "any disease, not tuberculous but flourishing in a tuberculous constitution," thus corresponding to the meaning of J. A. Fournier's parasyphilitic affections—tabes and general paralysis of the insane—before Noguchi demonstrated the *Treponema pallidum* in the nervous tissues of these sequelæ which were previously regarded as occurring in a soil watered by syphilis, but not directly due to that infection. "Paratuberculosis" has been employed for the condition now more generally known as "epituberculosis", but is now usually confined to conditions caused by acid-fast bacilli other than *B. tuberculosis,* such as the bacillus (*Mycobacterium paratuberculosis*) of Johne's disease; the more numerous saphrophytic acid-fast bacilli, such as Timothy-grass bacillus and the

* An Address delivered before the National Tuberculosis Association, Toronto, June, 1933.

smegma bacillus, hardly come into the picture. It must, however, be admitted, on the analogy of typhoid fever, that it would be logical to include under the term "paratuberculosis" pathogenic acid-fast bacilli other than the tubercle bacillus, such as the "leprosy" bacillus and Johne's bacillus. Clinically, confusion may occur, for example, in cases such as those recently recorded by Valtis, Paisseau and van Deinse of two types of *Bacillus paratuberculosis* non-virulent to guinea-pigs and rabbits in the sputum of a child aged six years, with pulmonary tuberculosis, and by Nègre, Valtis and Labernardie of a *Bacillus paratuberculosis* in a patient with pulmonary fibrosis.

"Pseudo-tuberculosis" has been used in somewhat the same way as paratuberculosis; thus a synonym for Johne's disease is chronic pseudo-tuberculous enteritis of cattle. Since 1883, when Malassez and Vignal described zooglœal tuberculosis in a guinea-pig, due to coccoid bacilli, the word "pseudo-tuberculosis" has been used for diseases simulating tuberculosis anatomically, but recognized to be due to various causes other than the tubercle bacillus, such as bacteria, protozoa, moulds and worms. Flexner in 1897, wrote on "Pseudo-tuberculosis hominis streptothricha," and Dévé, in 1902, described "pseudo-tuberculose échinococcique du péritoine," both of them condensing into the title the real character of the morbid lesion as well as its imitation of that produced by Koch's bacillus. Dévé gave an account of small granulomas, the size of a pin's head to that of a millet seed, containing scolices or fragments of hydatid membrane, situated on the peritoneum after rupture of a hydatid cyst. On Feb. 21 and March 7, 1899, when I was one of the secretaries of the Pathological Society of London, a discussion on pseudo-tuberculosis was opened by Sims Woodhead who, after confessing that he used the word during his investigations for the Royal Commission on Tuberculosis, and referring to the various conditions which had been so described, was supported by most of the subsequent speakers and by a special committee appointed to report on the subject in the conclusion that the term should be discarded altogether. But in spite of this, its use has not died out; this year Sergent, Mignot and Durant described "Les formes pseudo-tuberculeuses du cancer primitif du poumon," which may imitate all the varieties, acute or chronic, of pulmonary and pleural tuberculosis.

The introduction of new words is justified in order to designate new discoveries and ideas; Bezançon and Braun (1927) invented the word *tramite* to describe the "pre-phthisical" change in the interstitial connective tissue of the lung before any intra-alveolar exudation occurs, and though detected by radiology not revealed by auscultation. Sergent (1929), regarding this change as the awakening in the lymphatics in adult life of an infantile infection, calls it *périlobulite tuberculeuse.*

Tuberculide.—The meaning of this word, suggested on the analogy of syphilide by J. Darier, has been somewhat modified in accordance with the change or advance of opinion. Cæsar Boeck's original idea was that of a toxic eruption in a person with tuberculosis elsewhere; the conception of allergy has led to the view that the tuberculides are the outward and visible sign of the reaction between antibodies present locally and tubercle bacilli brought by the blood. It has, however, been suggested that the ultravirus is responsible for the tuberculides. Ramel, in 1930, reported the cultivation of tubercle bacilli from erythema multiforme, but both Percival and A. J. Gibson (1931) and Hallam and Edington (1933) obtained negative results.

Epituberculosis.—In 1920 Eliasberg and Neuland proposed the title "epituberculous infiltration of the lung" for a condition previously recognized and described under various names, and showed that the prognosis of pulmonary tuberculosis in young children was not necessarily so grave as had usually been thought. They spoke of it as a non-specific infiltration on a specific tuberculous soil. In 1883, Grancher, after referring to Woillez's description in 1872 of "simple pulmonary congestion" of a few days' duration, recorded cases of subacute pneumonia imitating pleuritic effusion in patients aged 19, 24, and 41 years, and called it "spléno-pneumonie"; in 1886, in an account of spleno-pneumonia, Bourdel pointed out the presence of a sero-albuminous exudate into the alveoli and mentioned that paracentesis of the chest was always negative. Hutinel, in 1911, was the first to associate Grancher's spleno-pneumonia with tuberculous glands in the neck, and later Arloing and Dufourt called it "spléno-pneumonie tuberculeuse." Ribadeau-

Dumas, in 1919, writing on perituberculous reactions of the lung in children, recorded cases with tuberculous mediastinal glands and signs suggesting caseous pneumonia but terminating in recovery. It has been regarded as a perifocal reaction, and, among the few necropsies, collapse of the lung around a tuberculo-caseous mass has been noted (Epstein). It has been described as "benign tuberculous infiltration of the lung" (Spence), "paratuberculosis" (Engel), and "curable tuberculous splenization" (R. C. Blanch). It has been regarded as an allergic response in the subjects of tuberculosis; in a child who, when four years old, had an attack which gradually passed off in a year, Langer observed return of the signs of consolidation and high fever after a subcutaneous injection of 1/10 mg. of tuberculin, these manifestations lasting for two weeks. I have seen a similar attack in a child who had previously had Henoch's purpura, but there was not any evidence of tuberculosis. According to Sergent it is due to infection with the ultravirus. A mechanical explanation, namely pressure exerted by enlarged mediastinal glands on the root of the lung causing collapse and lymphatic obstruction, has also been put forward. The signs of consolidation may persist for a very considerable time and so suggest a pleuritic effusion. Cases have recently been recorded by Goldberg and Gasul (10 cases), H. C. Cameron, Rothman, and Spence.

The name *Mycobacterium tuberculosis hominis*, though there may be some delay before it takes the place of the familiar *Bacillus tuberculosis*, is fully justified by the work of Fontes in 1910, confirmed after a long period of neglect by Vaudremer (1923), Calmette, Valtis and many others, proving that this micro-organism has a pleomorphic life-cycle with an invisible ultravirus, a granular, and bacillary (non-acid-fast and acid-fast) phases, Koch's acid-fast bacillus being the adult form of the ultravirus or adopted as a means of defence against an adverse environment. To the early bacterial forms Sanarelli and Alessandrini have given the name *protogènes tuberculeux*. Experimental injection of the ultravirus, which has but feeble pathogenic powers, has produced effects of several kinds, but usually unlike those associated with Koch's acid-fast bacillus; these are wasting and cachexia, simple hyperplasia of lymphatic glands, or a curable transient condition, recognizable only by a positive tuberculin reaction. Many years after Baumgarten's suggestion of the hereditary transmission by spores, the ultravirus has been proved to pass through the normal placenta of a tuberculous mother to infect the fetus (Calmette, 1925), and not to produce the lesions characteristic of Koch's bacillus, but to induce a pre-tuberculous (Fontes) or pre-bacillary (Calmette) state characterized by metabolic disturbances which seem roughly to correspond with those of the old strumous or scrofulous diathesis; this state either disposes to infection or, on the contrary, confers an increased resistance to infection. The latter result is shown in the slow course of tuberculous infection in the members of tuberculous families as compared with the rapidity in healthy families and in races with a virgin soil. Calmette, in 1930, described two groups of infection: (1) *granulémie pré-bacillaire* due to the ultravirus, usually acute and characterized by the absence or rarity of acid-fast bacilli; these conditions include effusions into serous cavities, erythema nodosum and multiforme, sarcoids, and papulonecrotic tuberculides; (2) *bacillose*, due to acid-fast bacilli, usually chronic, and either the final phase of the ultravirus or due to infection with Koch's bacillus. Sergent, Kourilsky, Durand and Benda criticize any such rigid scheme in a most complex subject, and consider that the life-cycle is continued and the effects of the virus and the mature bacilli may be active at different times in tuberculous adults. They, however, recognize a number of manifestations due to the ultravirus, such as asthma, and that there is a virulent ante-bacillary stage in pulmonary tuberculosis; Arloing and Dufourt, while agreeing about this virulent stage, believe that it is due to infection with the bacillus which is not yet acid-fast.

The pleomorphic life-cycle and phases of the *Mycobacterium tuberculosis hominis* and the different anatomical lesions thus produced have potentially widened the vista of the pathological conditions possibly due to tuberculous infection, in other words, of pleomorphic lesions to correspond with bacterial pleomorphism. The subject is beset with difficulties, and it is tempting to speculate on a too hasty extension of lesions due to phases of the organism. It, however, seems clear that the absence of acid-fast bacilli and of the characteristic giant-cell system and necrosis

cannot any longer exclude tuberculous activity. In some recognized tuberculous lesions, or in parts of them, such as lupus vulgaris and hyperplastic tuberculosis of the intestine, the bacillary form is rare. In hyperplastic tuberculosis of the intestine fibrosis is a prominent feature, usually ascribed to either a good tissue-resistance or an attenuated infection; is it possible that there is a mixed infection of different phases of the life-cycle of the micro-organism? In some chronic lesions fibrosis is the outstanding feature, and it was suggested long ago that the tubercle bacillus either in an attenuated state of activity or its bovine strain might be responsible for chronic hyperplastic peritonitis (Nicholls, 1902; McWeeney, 1906); in 1892 Hanot and Gilbert ascribed some cases of hepatic cirrhosis to tuberculosis. These hypotheses deserve and no doubt will now receive further consideration.

Hyperplastic tuberculosis of the intestine.—In 1891 Hartmann and Pilliet gave the first real account of this condition of tuberculous typhlitis imitating malignant disease both clinically and to the naked eye. Histologically, it was described as showing a combination of tuberculous and simple inflammation, resembling the appearance in common lupus and due to secondary infection of a lesion primarily due to an attenuated tuberculous infection. Billroth in the same year recorded a case simulating carcinoma, and cases rapidly accumulated, some being retrospectively recognized, so that in 1893 Benoit was able to collect twenty-three. In 1894 Coquet called it "the surgical form of tuberculous tumour of the cæcum." Conrath, in 1898, made the total number of cases 85, including a case of Gussenbauer's in 1882, and Irié in 1899 analyzed 41 cases operated upon. In 1900 Crowder recorded a case combined with carcinoma and quoted a similar example. Lartigau, in his thorough review of the subject, pointed out that the typical tuberculous histology is often absent, and that in places there may be an embryonic infiltration imitating sarcoma. In 1906 Hartmann called it the "hypertrophic and stenosing form of tuberculosis of the cæcum", and Berger spoke of it as the "real surgical tuberculosis of the cæcum." From the cæcum it may extend into the ileum, and in rare instances it involves the colon more widely (gas-pipe colon). The mucous membrane is thrown into folds, or is papillomatous from the compression exerted by the thickened and infiltrated submucosa and circular coat, but is usually free from ulceration. It was long thought, but not established, to be a primary infection with bovine bacilli; in 1931 Anderson and Munro reported 2 cases due to the bovine strain, and in 1931 one due to the human strain; the last patient showed evidence of tuberculous disease elsewhere, but not active in the lungs, and apparently the intestinal disease occurred in another member of the family. Like actinomycosis, from which it must be distinguished, it usually attacks the ileo-cæcal region, according to Lartigau, in 95 per cent of the cases. Though sometimes suggesting chronic appendicitis it usually resembles malignant disease; it has been said that most of the reputed, but not histologically confirmed, cases of cæcal carcinoma in which permanent recovery followed excision have been examples of hyperplastic tuberculosis. The lymphatic glands behind the cæcum are usually tuberculous. Stricture of the rectum, usually ascribed to syphilis, may be due to tuberculosis of the hyperplastic type, even though in a syphilitic subject, as was first pointed out in 1895 by Sourdille who reported 5 cases. In 1897 Lapointe added 4 more cases of this kind. Hyperplastic tuberculosis of the sigmoid colon may also simulate carcinoma.

The vermiform appendix usually, but not always, escapes the change in the cæcum, but it may be obstructed, distended, and involved in adhesions. Petit collected 9 cases described as confined to the appendix, but Howard Kelly doubted if they were all authentic, and quoted one reported by Crowder. I examined one many years ago and Davis recently recorded one. In the duodenum it has been recorded twice (Garvin; Matthews, Delaney and Dragstedt) in neither of which were tubercle bacilli found. In the case reported by Matthews, Delaney and Dragstedt there was not any free acid in the gastric juice and the case was naturally diagnosed as pyloric carcinoma. In exceptional instances it has been confined to the small intestine; in 1933 Masson and McIndoe collected 7 examples, usually in the ileum, but it has been found in the jejunum (Ransohoff, Davis). It produces stenosis of the lumen. In Masson and McIndoe's case, a Sioux Indian, it was associated with a large hernia.

Diffuse chronic hyperplastic peritonitis, which gives rise to the "icing" of the peritoneal sur-

faces of the viscera and recurring ascites, has been ascribed to micro-organisms of a low grade of virulence, and among them the tubercle bacillus (A. G. Nicholls, 1902). It is tempting to assume that there is a hyperplastic form of peritoneal tuberculosis to correspond with hyperplastic tuberculosis of the cæcum. The incidence of tubercle bacilli in the ascitic effusions, for example of hepatic cirrhosis, which do not otherwise point to a tuberculous nature, suggests that tuberculosis may, either alone or in symbiosis with other microbes of low grade virulence, produce the dense fibrosis. As arteriosclerosis is sometimes associated with hyperplastic peritonitis, and as fibrotic tuberculosis is not rare in arteriosclerosis, it is conceivable that arteriosclerosis of the peritoneum may be partly responsible for the fibrogenic effect of the tuberculous infection.

Tuberculosis of the alimentary canal.—Except in the tonsils tuberculous disease in the mouth is rarely recognized. In the œsophagus the same is true, though in rare instances infected bronchial glands may rupture into it. In the stomach the hydrochloric acid protects against infection, and small ulcers in the subjects of pulmonary tuberculosis are not always tuberculous but may be due to the action of streptococci. In 1898, Blumer collected 30 cases of gastric ulceration, all secondary to pulmonary disease. Solitary tuberculoma, such as that recorded by Van Wart, is most exceptional.

In the duodenum tuberculous ulceration is very uncommon; in 1932, Matthews, Delaney and Dragstedt collected 123 cases, but in 18 only were there any local symptoms. Meckel's diverticulum, in the lower three feet of the ileum, occurs in about 2 per cent of bodies, and tuberculous ulceration, as part of the ulceration met with in 50 per cent or more of fatal cases of pulmonary tuberculosis, has been recorded; in 1932 P. Michael collected 9 examples.

Tuberculosis of the liver.—Although there are at least three forms of obvious tuberculosis of the liver—miliary, of the portal spaces and bile ducts, and tuberculomas—the incidence in man is much less than might be expected in the case of an organ receiving the blood from the alimentary canal. The lymphatic stream is against the passage of bacilli into the liver, and there is very little evidence that retrograde infection occurs. In generalized tuberculosis the liver, like the other organs, commonly contains miliary tubercles. In fatal cases of pulmonary tuberculosis miliary tubercles are found in the liver in 36 (Lavenson and Karsner) to 80 per cent (Saphir) of the cases after death. Tuberculosis involving the portal spaces and sometimes opening into the bile ducts is rare, and seldom gives rise to clinical symptoms; the absence of jaundice may be explained by the experimental evidence that jaundice does not occur until there is obstruction of nineteen-twentieths of the liver (McMaster and Rous).

Massive caseous tuberculomas which may soften down and form abscesses are very rare, thus contrasting with their frequency in birds and bovines. The symptoms vary, the clinical picture is not diagnostic, and malignant disease (Thayer), enteric fever, or hepatic abscess may be clinically simulated.

As regards the relation between tuberculosis and hepatic cirrhosis, they are both favoured by chronic alcoholism, chronic pulmonary tuberculosis usually becoming evident in the course of established cirrhosis, rather than *vice versa*. The question whether or not tuberculosis can give rise to ordinary cirrhosis has been much discussed, but clinically this sequence is very infrequent. It is natural to imagine that in some way the liver inhibits the growth of tubercle bacilli, and Marmorek, in 1903, came to the conclusion that this was due to chemical factors.

Tuberculosis of the spleen.—The spleen, like the liver, is commonly involved in generalized tuberculosis, but rarely by chronic caseous tuberculomas, though this is common in some animals. The caseous masses may be large and, unless and until they soften, to the naked eye resemble the nodules in the "hard-bake" spleen of Hodgkin's disease. In Winternitz's 51 collected cases tuberculosis was present elsewhere in 66 per cent, and in 80 per cent of the cases in which the liver was examined it also was tuberculous; it seems reasonable to associate the contractions of the spleen with the expulsion of tubercle bacilli into the splenic vein. From analysis of Winternitz's cases A. G. Gibson found that tubercle bacilli were isolated in 17 only; to these he added 4, making 21 in all. Clinically massive tuberculosis of the spleen has imitated chronic splenic anæmia, from which tuberculous enlargement of the lymphatic glands, if also present, helps in the differential diagnosis. As the liver may become enlarged

hepatic cirrhosis may be simulated. In 6 out of Winternitz's cases there was polycythæmia, but in none of these was the tubercle bacillus found, and doubt has been thrown on the influence of splenic tuberculosis in causing polycythæmia (Gibson); splenectomy, contraindicated in ordinary erythræmia, has given good results in splenic tuberculosis, and does not appear to be a bar in the rare cases with polycythæmia. Fibrosis of the spleen has been ascribed to tuberculosis; experimentally it has been produced by injections of slightly virulent tubercle bacilli (Achard and Weil; Paris and Salomon). Tapie collected 9 cases of splenic fibrosis in man; some of the spleens though free from naked-eye tuberculosis showed it microscopically. Weil regarded the "fibro-adénie," described by Banti, as due to healed tuberculosis.

The endocrine glands. — In the endocrine glands, except the adrenals, tuberculosis is infrequent. I have not any references to its occurrence in the pineal body or in the islands of Langerhans. When the pancreas is involved in tuberculosis, the process is usually due to tuberculous adenitis. The interstitial tissue in the testes may sometimes be invaded by extension from the tuberculous epididymis.

The thyroid.—Rokitansky stated in 1861 that the thyroid was never the site of tuberculosis. In 1933 A. and A. C. van Ravenswaay collected 17,963 cases in which the thyroid had been examined, either at operation or necropsy, and found the incidence 0.34 per cent, but from 4 to 12 per cent in those dying with active tuberculosis. Like other parts of the body it often shares in generalized miliary tuberculosis, but is very rarely the site of caseous tuberculomas; in 1896 I recorded tuberculous caseous abscesses in the thyroid associated with tuberculosis of the first lumbar vertebra and of the sacrum; a thyroid abscess opened into the œsophagus, which was also perforated in several places by suppurating tuberculous glands around the innominate artery. In rare instances (Kraft; A. and A. C. Ravenswaay) a chronic non-suppurative tuberculous inflammation, or hyperplastic process, renders the thyroid so hard as to imitate malignant disease or the ligneous thyroiditis first described by Bowlby in 1885, and eleven years later by Riedel, after whom it is commonly called. Is the thyroid highly resistant to tuberculous invasion? Tuberculosis very rarely attacks the subjects of exophthalmic goitre, and I have the impression that it is not infrequent in hypothyroidism. Nathan, however, did not find that exposure of tubercle bacilli to colloid pressed out of the thyroid affected the activity of tubercle bacilli, as estimated by their inoculation into guinea-pigs. Byrom Bramwell in 1894 obtained benefit from thyroid extract in lupus vulgaris, but when taken regularly in considerable doses for "slimming" it has so reduced nutrition as to be followed by tuberculosis (Tanon).

The pituitary gland.—Tuberculosis arising in, rather than in the neighbourhood of, the pituitary has been regarded as extremely rare. Boyce and Beadles in 1893 reported a "tubercular-like granuloma" of the anterior lobe, and referred to two cases recorded by Wagner (1861) and Beck. In 1914, however, Simmonds recorded 4 cases observed in one year and referred to 9 examples published by Heidkamp, thus suggesting that it is not so rare as had been thought.

HODGKIN'S DISEASE

Some of the cases in Hodgkin's original description, in 1832, of "Some morbid appearances of the absorbent glands and spleen" were almost certainly tuberculous. In 1898, Carl Sternberg put forward the view that Hodgkin's disease was a peculiar form of tuberculosis analogous to lupus. Inoculation of the affected glands by Andrewes (1902), Reed (1902), Longcope (1903) and others has given varying results, sometimes positive and sometimes negative, and justifies the conclusion that tuberculosis may be a secondary infection. In 1910, and again in 1923, Fraenkel and Much described the granular form of the tubercle bacillus as present in the glands in almost all the cases examined. L'Esperance, in 1930, ascribed Hodgkin's disease to avian tuberculosis, a view van Rooyen contested. Ewing's authoritative opinion is in favour of a tuberculous origin, and inoculation of the ultravirus phase of the *Mycobacterium tuberculosis hominis* has been observed to be followed by hyperplasia and multinuclear cells like the "lymphadenoma cells" in the lymphatic glands (Martinolli). Mervyn Gordon, however, after a prolonged research, has now brought forward very strong evidence that the pathogenic agent in Hodgkin's disease is a thermostable virus belonging

to the same category as the heat-resisting viruses of trench fever and swine fever.

THE COMBINATION OF TUBERCULOSIS AND CANCER

The question of a possible antagonism between these two common killing diseases which are effective at different periods of life has long been discussed. Their combination was noticed a hundred years ago, and the chronic irritation of tuberculous inflammation might reasonably be anticipated to be a frequent antecedent of carcinoma. Lupus-carcinoma is well recognized, but there can be little support for any suggestion that the recent increase in primary carcinoma of the lung, which so often starts in the bronchi, is related to chronic pulmonary tuberculosis.

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NOTE: Those specially interested will find the full bibliography for this article in the Transactions of the National Tuberculosis Association, 1933.

SOME PITFALLS IN THE DIAGNOSIS OF CONDITIONS GIVING RISE TO CHRONIC ABDOMINAL DISCOMFORT*

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THE road which leads to a correct and complete diagnosis of the diseases which are responsible for causing chronic abdominal discomfort is strewn with pitfalls. The pitfalls are prepared by diseases or dysfunctions which alone, or in combination with each other, are capable of producing a mimicry of the symptoms of intraperitoneal surgical lesions. This mimicry is never perfect. It may be sufficiently good to deceive us if, in an unwary moment, we forget the possibility of their existence and neglect to search for them. The mental habit, easily acquired, of attempting to interpret the symptoms complained of by the patient as evidence of an abdominal surgical disease makes us easy victims for these traps. From past experience we are fully aware that each patient who complains of abdominal discomfort belongs to one or other of three groups. In the first group are those who are suffering from an intraperitoneal surgical condition and from nothing else. For each of these a properly conducted laparotomy is the only treatment which offers relief. In the second group are those suffering from an abdominal surgical disease, associated with either an extraperitoneal surgical lesion or some medical disease or dysfunction inside of, or outside of, the abdomen. In these cases laparotomy alone can never give complete relief. The associated disease must be recognized before the diagnosis is complete; it must be corrected before the abdominal discomfort is overcome. The third class embraces those in whom there is no intraperitoneal surgical condition. In these cases laparotomy will bring only disappointment to the patient and discredit to surgery.

Those patients belonging to the last two groups, who come with a history of having

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already undergone a laparotomy without relief, or with only partial relief, present a special challenge to our diagnostic skill. From a careful study of these we can learn much. What led the operator into the error of making a wrong or incomplete diagnosis? The answer in almost every case will be, failure to interpret the significance of localized pain and consequent disregard of the meaning of the associated symptoms. If pain may guide us to a pitfall into which we stumble, can we not compel it to guide us to all the locations where pitfalls lie, so that we can examine the terrain and, in finding them, avoid them? The answer is so largely in the affirmative that in this search we may accept pain as our guide, but not necessarily as our counsellor and friend. Collectively, the patients under consideration have one symptom in common—they all complain of some degree of pain. The pain will vary through all gradations, from dull vague discomfort to attacks of great severity, separated by long or short intervals. It may or may not be influenced by food or exercise; it may be localized or it may radiate. Individually, the patients will present such associated symptoms, singly or in combinations, as flatulence, belching, distension, nausea, vomiting, hæmatemesis, melæna, jaundice, weakness, loss of weight, disturbance of intestinal or urinary excretion. Occasionally one may state that he is conscious of a lump in the abdomen.

If pain is to be our chief guide in the search for lesions which may produce misleading symptoms, we must keep in mind some general considerations of anatomy and physiology. Abdominal pain is caused by irritation of the sensory fibres of one or more of the lower six dorsal nerves. This irritation may be applied directly in some part of the course of the nerve by a mechanical or chemical agent. It may be applied indirectly by disease or disordered function in organs supplied by sympathetic nerve fibres, which are intimately connected with the spinal sensory nerves of the abdomen. Excluding for the moment systemic poisons, which have a roving commission to produce pain, it follows that abdominal pain, even localized pain, means nothing more than that a pathological process exists in organs or structures which are directly or indirectly, through innervation, connected with the lower six dorsal nerves. In order to avoid falling into error each of these structures must be examined, bearing in mind the pathological conditions to which it is subject. When all the pathological lesions have been discovered they must be correlated with the symptoms which are associated with the pain, if we are to arrive at a correct and complete diagnosis. According to the skill and judgment which we can bring to bear in performing these two tasks will our success be measured. It is a long and arduous labour, which must be undertaken with each individual case. There is no "royal road." The problem can be relieved of drudgery and even made interesting if we approach it in an orderly manner. All the organs and structures referred to are found in one or other of six anatomical areas, which can be explored in sequence—the peritoneal cavity, the thorax, the anterior abdominal wall, the pelvis, the retroperitoneal space, and, behind all, the bony spinal column with its contents. Errors of diagnosis arising out of failure to recognize an intraperitoneal surgical condition we will refer to only indirectly. If in all these cases we keep in mind the possibility of cancer as a cause of the abdominal discomfort, and make a deliberate effort to demonstrate or exclude its presence, the possibility of overlooking a benign surgical lesion will be materially lessened. This applies to patients of all ages. One has seen cancer of the stomach in a girl of twenty, cancer of the recto-sigmoid in a youth of nineteen, and malignant disease of other organs in very young children.

It matters little in what order we study these areas. We may conveniently begin with

The peritoneal cavity.—Directing our attention to the more spectacular surgical diseases of the digestive tube and its accessory organs we are apt to forget the humble non-surgical disturbances of function. In this way we may permit ourselves to be deluded into the belief that symptoms which result from them are manifestations of a surgical lesion. Functional disturbance of the colon is very frequently met with. This may be manifested in various ways. As a result, such terms as irritable colon, spastic colon, mucous colitis, chronic constipation, appear in medical literature. Chronic constipation is by far the most common type of colonic dysfunction; the history of its existence may not be obtained unless one asks the patient what laxative is used to regulate the

bowels. As we are limited to a general consideration of abdominal discomfort it will be convenient to group all of these conditions under the designation of *Dysfunction of the Colon.*

Whether alone or complicated by visceroptosis colonic dysfunction will in many cases cause distension, belching, distress after eating, and occasional nausea or even vomiting. These symptoms are also part of the symptom complex of chronic cholecystitis. The Graham test carried out by the oral administration of dye may mislead us. In the presence of colonic dysfunction it will frequently show imperfect filling or absence of filling of the gall-bladder. The test, repeated on the same patient after the dysfunction of the colon has been corrected by rational measures, results in perfect filling.

These patients may have pain. Owing to gaseous distension of the cæcum the pain may be more marked on the right side. One could cite the histories of a number of such cases, who have been seen before, and again sometime after someone had operated for chronic appendicitis.* All of their symptoms persisted. They were completely cured by placing them under the care of a physician, who weaned them of their purgative habit and induced them to adopt a rational diet and mode of life. Colonic dysfunction presents the greatest difficulty when some surgical disease of the abdomen is suspected to co-exist, or where a lesion in some other area, capable of producing abdominal pain, is known to exist. The picture is confusing. A therapeutic test is of value. We are dealing with a chronic condition and there is plenty of time. If the patient is placed under medical care and the disturbance of function is corrected, the residual symptoms, if any, will be more easily interpreted.

Achlorhydria of the essential or unexplainable type is by no means rare. It does not necessarily result in discomfort. In some cases it may produce dull epigastric pain. A physician of fifty, whose previous history was unimportant, began to suffer from dull persistent epigastric pain, not markedly influenced by food. After three months of unsuccessful treatment, dietary and medical, he consulted an eminent surgeon. A complete examination produced negative results, with two exceptions. There was complete absence of hydrochloric acid in the stomach contents, and the Graham test by oral administration of dye showed imperfect filling of the gall-bladder. A diagnosis of chronic cholecystitis was made and cholecystectomy advised. The patient, being reluctant to submit to operation, readily accepted the suggestion of a medical friend that he first try half a drachm of dilute hydrochloric acid with his meals and eat ordinary food. Within a week the pain was gone. It has not returned during the eight years which have since elapsed. In a few cases where achlorhydria was the only positive sign found during examination I have seen equally gratifying results.

The spine.—The spinal column and its enclosed structures may be the site of diseases which produce abdominal pain.

The gastric crises of *locomotor ataxia* have been mistaken for evidence of surgical disease in the upper abdomen. I recall such a case in a man who had undergone two operations on the upper abdomen without relief. Such a mistake could not occur if the possibility of spinal cord lesions were kept in mind and steps taken to exclude them. Lesions in the bony structures of the spine are a more frequent source of error.

Caries of the lower dorsal vertebræ, by causing pressure on the spinal nerve trunks, may result in pain referred to the abdomen. Not infrequently the pain is right-sided and may be severe. One can recall such cases, where a diagnosis of recurring attacks of acute appendicitis was made. An examination of the back would have precluded the possibility of such an error.

Chronic hypertrophic osteoarthritis is of much more frequent occurrence. Usually it is widely distributed and causes bilateral pain, not only in the abdomen but in the chest wall as well. Occasionally it is localized to the lower dorsal vertebræ, in which case the pain is abdominal. During the past year two patients with this condition came under observation who had submitted to laparotomy, one for chronic appendicitis, the other after a diagnosis of chronic cholecystitis. In neither was the operation followed by improvement. In both cases we were

* As the expression, chronic appendicitis, will occur later it must be clearly understood that under this term is not included chronic recurring attacks of acute appendicitis. Chronic appendicitis is a definite entity. It is one of the most difficult of all abdominal surgical diseases to diagnose. The diagnosis is justified only after all other causes of lower right-sided pain have been excluded. It may be wrong even then.

able to demonstrate by x-ray, in addition to slight "lipping" in most of the vertebræ, a marked hypertrophic process at the right side of the 9th, 10th, and 11th dorsal vertebræ. In the case of the man who had had cholecystectomy done a long-standing chronic constipation was present, which was sufficient to account for his digestive discomfort. He gave the history of having had an examination with x-ray, which confirmed the diagnosis of gall-bladder disease. The possibility of being mislead by the results of this in cases where dysfunction of the colon exists has already been referred to. The x-ray is a priceless aid in diagnosis, but, after all, it is only an aid; unless we interpret the physical signs visualized by means of it in the light of the patient's history and the evidence secured by physical examination, it may prove to be only an additional pitfall. It may not be possible to demonstrate osteoarthritis of the spine by ordinary physical examination. A flat x-ray plate of the thorax and abdomen, which should be the first requisite in any x-ray examination of the abdomen, will reveal it, if present. In addition it will give some information regarding the next area to be considered.

The retroperitoneal space.—In this region pathological conditions in arterial trunks, lymphatic glands, kidneys, kidney pelves and ureters, may cause abdominal pain.

Aneurysms of the abdominal aorta or of its branches, though rare, are a possible source of error. One recalls an instance where a very competent surgeon recognized an aneurysm of the abdominal aorta only after he had opened the abdomen.

The retroperitoneal glands may produce symptoms from either benign or malignant disease. A systematic search for enlarged glands by careful palpation of the abdomen will often, though not always, enable us to recognize them. Most of us have had the experience of finding unsuspected tuberculous glands during the course of a laparotomy which did not disclose any intraperitoneal surgical lesion. The presence of persistent distension and occasional attacks of diarrhœa in these cases at least suggests the possibility of this condition being present, even if glands cannot be felt.

Primary *cancerous involvement of the retroperitoneal glands* is rare, and in the early stage impossible to diagnose. Secondary malignant involvement of the glands of this region is of more common occurrence. Its presence is usually an indication that the stage of operability has passed. Ignoring a significant feature in the patient's history may lead us into serious error. Within the past six months the writer was consulted by a young man whose complaint was right-sided abdominal pain of a year's duration. Three weeks before the consultation he had undergone an operation for chronic appendicitis. No relief followed. Further questioning elicited the history that two years ago a right orchidectomy for tumour had been done. Abdominal examination revealed an indurated mass extending from the pelvic brim to the right costal margin.

Unrecognized *diseases of the kidney and ureter* are responsible for many failures and disappointments. Warning of their presence is often given by the peculiar character of radiating pain; by disturbance of urination; or by evidence obtained from microscopic examination of the urine. Pathological conditions in the upper urinary tract, however, are not always characterized by constant signs and symptoms. The pain may not always radiate; there may be no disturbance of urination. In some cases, or on occasions, the microscopic examination of the urine may be negative. We discover these diseases only if we search for them, utilizing in that search such instruments of precision as the microscope, the culture tube, the cystoscope, and the x-ray.

One may illustrate by brief reference to cases which have come under observation shortly after having undergone an abdominal operation without relief or with only partial relief. In the cases in which an upper abdominal scar was found—one of tumour of the left kidney in which the earliest symptoms had been epigastric pain and vomiting and one of tuberculosis of the right kidney with intermittent drainage—the attacks of pain bore a striking resemblance to the pain of biliary colic. One had chronic hydronephrosis. One woman, with persistent left-sided abdominal pain, had undergone two laparotomies for "adhesions". Her pain was permanently relieved after the dilatation of a stricture of the left ureter. In a number with lower abdominal scars were found impacted stone in the right ureter, tuberculosis of the right kidney and ureter, and chronic pyelitis with acute exacerbations.

The thoracic cavity.—Obviously the posterior

layer of peritoneum does not form a water-tight barrier between the retroperitoneal space and the peritoneal cavity. Neither does the more substantial diaphragm serve that purpose between the abdominal cavity and the thorax. This fact has been impressed upon us with dramatic force on occasions when we have spent anxious hours before deciding that acute right-sided pain and muscular spasm were not due to an acute appendicitis but to a *basal pleurisy*.

The problem of excluding thoracic lesions is not limited to these acute crises. Most consulting physicians, and perhaps all physicians engaged in treating tuberculosis in sanitaria, can point to patients who had undergone a laparotomy for some chronic condition, particularly chronic appendicitis, a short time before pulmonary tuberculosis was recognized. While some degree of abdominal pain, anorexia, nausea, weakness, loss of weight, and anæmia may be manifestations of an abdominal surgical condition, it is well to remember that these symptoms may be the warning of incipient *pulmonary tuberculosis*.

Occasionally, one sees a patient who complains of upper right-sided abdominal pain from whom a history of an attack of *right-sided pneumonia*, complicated with pleurisy, can be obtained. If there is some limitation of movement on respiration, the possibility of persistent pleuritic adhesions causing dragging pain should be considered. In such a case a coincident dysfunction of the colon may complete a set of symptoms which suggest chronic cholecystitis.

Frequent reference has been made in recent years to the possibility of mistaking the acute epigastric pain complained of by some patients suffering from *coronary occlusion* for evidence of an upper abdominal surgical condition. From personal observation I am convinced that the chronic forms of cardiac disease may sometimes give rise to symptoms which are erroneously ascribed to a surgical condition in the upper abdomen. In these cases the fact that the pain is increased by effort, that it is substernal as well as epigastric, and that effort results in shortness of breath, should direct attention to the heart. Here again a therapeutic experiment in the form of medical treatment may clarify the situation.

The abdominal wall.—During examination of the abdomen conditions in the abdominal wall which are responsible for pain may be missed unless we look for them. Painful conditions in the muscles and fascia in other parts of the body are usually recognized, whether designated myalgia, fibrositis, or neuralgia. In the abdominal wall a similar condition is occasionally found. The tenderness is elicited when the muscle is in a state of contraction and not when it is relaxed. It may give rise to pain so persistent or of such frequent recurrence that a diagnosis of some intraperitoneal surgical condition is made. In palpating the abdomen one frequently discovers small openings in the mid-line above the umbilicus through which protude tiny masses of preperitoneal fat. These epigastric herniæ usually produce no symptoms. Occasionally they give rise to periodic attacks of pain accompanied by local tenderness. I can recall two cases in which after justifiable operation on the upper abdomen attacks of pain persisted until this cause was discovered and corrected by a simple operative procedure.

The pelvic cavity.—Pathological conditions in the pelvic cavity may produce lower abdominal pain. The failure to search for them is responsible for many errors in diagnosis. These structures are so easily accessible to the examining finger, introduced into the rectum or the vagina, that neglect to make the investigation is inexcusable.

An enumeration of some of the conditions which may account for lower abdominal pain in the female would include pelvic cellulitis, chronic salpingitis, a small ovarian tumour with a long pedicle subject to partial twists. In the male a vesiculitis or prostato-vesiculitis may give rise to pain; if right-sided, the appendix may again become the scapegoat.

In both male and female an obstructive growth in the rectum or recto-sigmoid may account for abdominal distress. I can recall two such cases, one in a man, the other in a woman. In each of them an operation for chronic appendicitis had been done. Two or three weeks later an inoperable cancer of the rectum was discovered. The few minutes required for this examination as a routine procedure are never wasted. Even if nothing pathological is discovered, the examiner's finger is made more familiar with the outline and consistence of normal structures.

Chemical poisons.—Perhaps the most familiar

example of abdominal pain produced by chemical poison is *lead colic*. This condition, happily rare in this country, is more likely to be confused with acute surgical conditions.

The chronic abdominal discomfort produced by the poisons developed in certain diseased conditions of the thyroid gland merits more attention than it has received. Under the term *thyro-toxicosis* is included all the toxic manifestations of exophthalmic goitre and toxic goitre. Among the cardinal signs of this condition is gastro-intestinal disturbance. It is always accompanied by one or more of the other classical signs and symptoms of the disease,—tachycardia, myasthenia, loss of weight, nervousness, tremor, ocular signs, with or without enlargement of the thyroid gland. If they are not ignored the abdominal symptoms are not so likely to mislead us.

A manifestation of the gastro-intestinal disturbance may be dull, rather persistent pain in the right side of the abdomen, which may be attributed to *chronic cholecystitis* or *chronic appendicitis*. It has been suggested that this abdominal discomfort may be due to fermentation of imperfectly digested food in the cæcum and colon. Owing to increased metabolism and the consequent insistent demand for more fuel, food is hurried through the small intestine into the cæcum without allowing time for completion of the digestive process.

The patient with thyrotoxicosis may have a coexisting chronic abdominal surgical condition. If so, the thyroid condition should always be regarded as the major and more urgent one. One has long ago learned this by bitter experience. Any operation done in the presence of active thyroid symptoms is liable to precipitate an acute thyroid crisis. It may be uncontrollable. If thyroidectomy is done first it serves a double purpose. As a therapeutic measure it clears up the abdominal discomfort due to thyroid intoxication. If an abdominal surgical condition co-exists, thyroidectomy converts the patient into a reasonably safe risk for laparotomy.

We may easily fall into a trap if we forget the possibility of another systemic poison. *Syphilis* is the master of mimicry. This statement can best be illustrated by a case report.

Three years ago the writer was consulted by a young man who gave the history that during the preceeding six months he had suffered from recurring attacks of epigastric pain followed by jaundice. Prior to that time he had never had any illness. He denied venereal infection. Three months after the onset he had consulted a doctor, who made a diagnosis of gallstones. He submitted to cholecystectomy. The symptoms following operation were the same as before. A diagnosis of stone in the common duct was made. At operation neither stone nor obstruction was found in the common duct. The liver showed grayish yellow areas, which suggested the possibility of syphilis. A Wassermann test made in the course of the next few days gave a strongly positive reaction. Fortunately for all concerned, the patient responded to antisyphilitic treatment and has remained well since. In this case the blood taken for the Wassermann test during the examination in the office was accidentally spilled. In view of his denial of venereal infection it was taken for granted that syphilis was not present.

This taking something for granted, instead of proving the ground, is more likely to lead us into pitfalls than either ignorance or lack of skill in making an examination.

A New Pupillary Test in Pregnancy.—Z. Bercovitz (*Am. J. Obst. & Gynæc.*, June, 1933, p. 882) describes a simple test for pregnancy. He finds that if five or six drops of the patient's blood, diluted with one drop of normal saline—or, preferably, with a 10 per cent sodium citrate solution—be placed in one conjunctival sac, the pupil of that eye will either contract or dilate if the patient be pregnant. There is a prompt and definite change in the size of the pupil as compared with that of the other eye. Bercovitz has observed 382 patients. He and his colleagues tested 183 pregnant women. Positive reactions occurred in 155 cases (an average of 84.7 per cent), while there were 15 negative and 13 doubtful reactions. On the other hand, 154 non-pregnant individuals (of whom 16 were men!) failed in every case to show the reaction. In one series many patients were under treatment for syphilis, but this did not affect the test, nor were there any signs of eye injury. The test can be done in two minutes, and the reaction persists for (approximately) five minutes. In one pregnant patient a positive pupillary reaction occurred twelve days after the onset of the last menstrual period. It was found that a 0.2 per cent phenol solution instilled into the conjunctival sac, either before or during a pupillary reaction, inhibits it. Neutralized female sex hormone, isolated from the urine of pregnant women, failed to cause a pupillary reaction when instilled into the conjunctival sac of 14 pregnant women. All these women reacted positively to their own blood. Forty-one post-partum cases were observed. Thirty-four had negative pupillary reactions. One patient who had a positive reaction before delivery was negative 15 minutes after the birth of twins and expulsion of the placenta.—Abs. in *Brit. M. J.*

WEIGHT-TAKING IN PRE-NATAL CARE*

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WEIGHT-TAKING as a means of detection of an incipient toxæmia of later pregnancy was advocated by Zangemeister[4] as early as 1916. Davis[2] advocated its use as a routine part of pre-natal care in 1923. The absorption of water, with a consequent rapid increase in body weight, is known to precede the occurrence of visible œdema in nephrosis and cardiac decompensation. Yet we know of very few clinics, either public or private, where the use of a pair of scales, and the charting of weight during pregnancy, form part of routine pre-natal care. Why is this so? Partly, perhaps, because, owing to the date of publication, Zangemeister's ideas were not readily accessible; partly perhaps because at the time the "œdema theory" of eclampsia formed one of many theories; and partly, perhaps, because of the difficulty in accepting a figure which should represent the normal weight increase during pregnancy, and above which a toxæmia inevitably occurred. Yet certain phenomena related to water retention in the absence of tangible œdema are facts of common clinical observation in obstetrics. Changes are observed in facial appearance, a characteristic coarsening of the features which is frequently associated with pregnancy. In contrast, there is the change back to normal after delivery and the subsequent diuresis, a change occurring with dramatic suddenness in which the features regain a thinner contour, the heavy coarse expression disappears, and the patient seems to have retraced the passage of several years. These changes in appearance of the pregnant patient so often escape notice because of their very gradual onset. Now and again the patient herself may remark on them, and may make the occasional observation that her rings and gloves no longer fit, or that her hands feel tight and no longer close readily. More usually, however, she is unconscious of any change. In other words, the patient, like the clinician, is in ignorance of the development of water retention until the usual obvious œdema of the face and extremities appears.

Water retention and salt (sodium) retention clinically occur together. Harding and Van Wyck[3] have stressed the part played by salt, taken by mouth or given intravenously, in the production of both major or minor symptoms of a toxæmia of pregnancy. As we believe the accumulated evidence that water retention is a factor in the development of the toxæmic state, the early detection of water retention and its prevention is certainly a matter of great practical importance.

What factors underly weight changes in normal pregnancy? In the first trimester there is often a loss of weight of from one to five pounds. During the first three months while the proteolytic activity of the chorionic villi is at its height, before the formation of the placenta, there is a negative nitrogen balance, showing that more tissue is broken down than is built up. This effect on the general weight fails to be offset by any changes in tissue fluids and increase in blood volume. With the onset of the second trimester, the metabolism changes, and from this point there is a steady increase in weight. The gain is due to several factors:—(1) the steadily growing fetus; (2) a general maternal tissue increase, in addition to the obvious increase in the breasts and uterus; (3) an increase in blood volume, which is accomplished by a dilution of the blood solids; and (4) the accumulation of water in the tissues. When the clinician seeks to interpret and control the weight curve of the pre-natal patient he must keep these various factors in mind. What increases in weight during the second and third trimesters are to be considered normal? The very early figures of Gassner (in 1862) show an average gain during the last three

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months of 1/13th of the body weight at the beginning of that period. This means 3½ to 5 lbs. gain per month. Zangemeister's figures, in 1916, indicate a gain of about 4 lbs. a month. Davis' figures, in 1923, on American women indicate an average gain of 5 lbs. a month, though he notes a patient who gained 9 lbs. a month in the last trimester, and who remained free from any symptom of toxæmia. All these figures were obtained by calculation from post-natal losses.

Whilst it is thus possible to establish average figures showing the gain in weight to be expected as normal, can it be taken for granted that women showing a gain per month within the normal average will be free from toxæmia, or that women making gains outside the normal will inevitably develop disturbances? Neither question can be answered in the strict affirmative, but the balance of evidence points to a much greater chance of the development of a toxæmia in the women who make the larger gains. In general, those larger gains which are unaccompanied by toxic disturbances are made by women who are overweight, quite apart from their pregnancy. The stimulus of pregnoncy increases their tendency to obesity. Such women are well benefited by strict dieting, with no detriment to the growing fetus. Davis mentions two such cases. Bingham[1] has recently advocated strict dietary measures during pregnancy for overweight women on physical grounds. He only allows such women a monthly gain of 2 lbs. and notes a big improvement in the conditions of labour. Births are much easier and minor repair work is greatly reduced. Even if the mother has lost weight, the babies are normal. Evidently it is a safe procedure to treat large gains in weight during pregnancy as if the increase were due to the toxæmic accumulation of water.* *Even if the excessive weight increases are the result of pregnancy obesity and, not toxæmia, treatment directed to the reduction of excessive weight is without danger to either mother or child.* Incidentally we may remark that, while the work of Prochownick, who attempted to reduce the weight of the child by a maternal diet poor in carbohydrate and fluids, has resulted in no practical benefit in the treatment of contracted pelvis, because it does not effect reduction of the fetal skull, it is nevertheless possible that a regime directed to reduce the general maternal weight, may occasionally result in reducing fetal weight. One has seen cases of toxæmia in which the fetus shows a massive œdema. It may be that milder cases of this occur with the absence of obvious œdema. The sudden post-natal loss of weight, seen often in extreme degrees in large babies, is often a loss of excessive water. If so, a regime which controls water retention in the mothers may in some cases result in a lowered fetal weight.

In a previous paper the authors have discussed the weight increases in pregnancy in relation to the toxæmias largely from an experimental standpoint. The one toxæmia which developed was correlated with a sudden gain of 7 lbs. in one month, though this occurred some time before the development of clinical symptoms. The present paper contains observations on 726 unselected private cases.

The pre-natal routine was to take the weight at each monthly (four weeks) report of the patient at the office. During the first trimester, the dietetic advice was the encouragement of increased amounts of food and fluids. Where the loss of weight was marked the patient was treated as a bed patient (Case 8). With the onset of the second trimester a moderate salt restriction was advised, the patient instructed to add no extra salt at table, but permitted freedom in the quantity of her diet. When a monthly gain of more than five pounds occurred, the diet was made salt-free, the caloric intake definitely reduced, and the patient's condition followed more closely, fortnightly, weekly or even more frequent examinations being made of the urine and the blood pressure. The result was usually a marked slowing in the rate of gain, and in some cases an actual loss for the next few weeks. Clinically, in some cases a certain heaviness in the appearance of the face would disappear with certain subjective symptoms of sluggishness, dullness, etc.

It is significant that if we separate into one group all the patients who in this series had monthly gains of eight pounds or over, a group numbering 62, that all the cases of toxæmia occurred in this group, with the exception of one patient who, early in pregnancy, was known to be a chronic nephritic. In this series only

* Babies of normal weight were born to mothers in an undernourished and even emaciated condition, in Germany during the World War and in Paris during the seige of 1870-71.

seven cases of definite toxæmia occurred. *In all but one of these a marked increase in weight preceded the appearance either of albuminuria or a rise in blood pressure. The exception was the patient with a definite history of chronic nephritis.*

CASE 1

M., gravida-1, aged 28, with no previous history of renal disease. There was fairly severe vomiting during early pregnancy, which was easily controlled. Nothing abnormal was found until at the end of the seventh month a gain of twelve pounds was noted. At this time both the urine and blood pressure were normal. A sample was requested every other day and the usual dietetic and salt restriction advised. The first urine specimen was not brought until a week had elapsed, and this was found to contain a definite trace of albumin. The patient was advised to return at once to the office for examination, but she delayed another three days before returning. On return, after a ten-day interval since her last weight record, she had gained only two pounds, but the blood pressure was 180/100, and there was a three-plus albuminuria. She was at once admitted to hospital and treatment begun, but as the condition was rapidly growing worse, with the blood pressure rising to 220 a Cæsarean section was done with satisfactory results, the 7½ months' child surviving. This patient showed a very severe disturbance, but had one neglected the significance of the twelve-pound gain the condition might have escaped notice until the actual onset of convulsions. The so-called fulminant eclampsia is perhaps not so sudden in onset as we are sometime inclined to believe.

CASE 2

S., gravida-3, aged 36. Her previous history was negative except that during her last pregnancy she had developed hypothyroidism and had required 3 grs. daily of thyroid extract (P.D. & Co.). The patient gained weight steadily throughout her pregnancy. To maintain a normal basal metabolic rate the thyroid was increased to 4 grs. and the usual dietetic restrictions were enforced. At eight months a gain of eleven pounds was recorded, with a blood pressure of 150/90 and no trace of albumin. The patient felt and looked dull and heavy, and a strict dehydrating routine was begun. Milk only and a total of not more than 200 c.c. of fluid was allowed. In three days the weight dropped seven pounds. Although on the third day of the treatment a trace of albumin appeared, this disappeared in a few days. The remainder of the pregnancy was uneventful, the blood pressure falling to 140.

CASE 3

D., gravida-1, aged 32, with a previously normal history except for mild scarlet fever in infancy. A rather continuously rapid gain indicated the necessity of examining this patient frequently. At the end of the eighth month a well marked toxæmia developed. On intensive hospital treatment this did not become aggravated, but was severe enough to warrant induction of labour three weeks before term with satisfactory results. In this case the rapid increase in weight made one watch more closely than usual and a well marked toxæmia suddenly made its appearance.

CASE 4

H., gravida-1, aged 27. Her previous history was negative. An apparently normal pregnancy continued until the beginning of the eighth month, when a ten-pound gain was recorded. The urine was examined twice weekly from this point. In two weeks the patient's weight had not increased, and her condition was quite normal. At the beginning of the ninth month the gain had begun again, and a well-marked one-plus albumin had appeared, with a blood pressure of 150. On intensive treatment this toxæmic process did not get worse, and the patient went into labour spontaneously two weeks from term. Here again the weight changes anticipated the appearance of toxæmia, and perhaps the treatment instituted converted a severe toxæmia demanding interference and hazard to mother and child into one mild enough to permit the onset of natural labour.

CASE 5

Similar to Case 4.

CASE 6

L., the only toxæmic patient in this small series with a definite pre-existing chronic nephritis. Here an abnormally increasing weight did not precede the other signs of impending danger.

CASE 7

X., gravida-1. Her previous history was negative. At six months a gain of eleven pounds was recorded, with otherwise negative findings, except severe headache. In a week the patient began to have vomiting, and the blood pressure rose to 190/100, with a trace of albumin. The blood pressure, in spite of purgation and starvation, rose in two days to 220, with a trace of albumin in the urine. Labour was induced, the fetus being sacrificed. A subsequent pregnancy in this patient was successful. The weight curve was normal throughout, and no symptoms of toxæmia appeared although the patient went into premature labour spontaneously at 8 months.

We have discussed weight-taking in pregnancy from the standpoint of the development of a toxæmia of later pregnancy. The following case shows an unusual loss of weight in early pregnancy and its significance.

CASE 8

K., gravida-1, aged 22, with a normal weight of 110 lbs., presented herself two weeks after the first normal period, complaining of feeling very ill, but of only slight nausea and no vomiting. Her weight was 95 lbs., blood pressure 80/60, and she had an appearance of emaciation. All the other findings were negative. It seemed good judgment to regard this marked loss of weight and her general appearance as an indication of a very badly disturbed metabolic equilibrium—in other words a toxæmia of pregnancy. The logical treatment of an early toxæmia, increased food, fluids and rest, was carried out. In a week, although the patient began to gain weight, the usual signs of severe hyperemesis began and required intensive treatment. It was another two weeks before the vomiting was controlled, and from that point on the patient rapidly regained her normal weight. The remainder of her pregnancy was normal.

CONCLUSIONS

These observations seem to justify the following conclusions.

1. Gains up to 5 lbs. per month in pregnancy can be considered as normal. It will be rare to find toxæmias developing in this group.

2. Gains from 5 to 8 lbs. per month should be regarded with suspicion. Such patients should be placed on a salt-poor diet and restricted in caloric intake. They should be watched more closely than the strictly normal woman.

3. Gains of 8 lbs. and over per month indicate a potential toxæmia. The closest supervision should be exercised over such patients.

4. The gains in weight have preceded the more usual signs of toxæmia, *i.e.*, albuminuria, œdema, hyperpiesis.

5. If we can prevent or control water retention the toxic process may be averted.

6. The small number of toxæmias in this series (about 1 per cent) justifies the practice of weight-taking in pre-natal care. Although definite signs of toxæmia developed in a few patients, none exhibited convulsions. The maternal mortality was zero.

In view of our observations it is not too much to urge on every obstetrician and general practitioner the practice of weight-taking during pregnancy. The use of scales should be general in every maternity and pre-natal care clinic. The taking and charting of the weight involves no expensive equipment or laboratory training. This duty could well be carried out by the nurse in charge, who would report any gains considered as excessive.

Our thanks are due to Miss M. McGoey for a painstaking examination of the case-histories in the preparation of the data of this paper.

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THE EVOLUTION OF CANCER FROM BENIGN CYSTIC AND PAPILLOMATOUS LESIONS OF THE BREAST*

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WE are in a time when all are earnestly searching for some new method of clinical approach or some advance in histological technique which will lead to the more frequent recognition of malignant disease in its early stages. My object in presenting this paper is to stress the importance of the clinical and histological advances which have been made in the field of breast cancer.

Within the last few years the methods of clinical examination of the breast have been so extended and improved, and the interpretation of the histological findings so radically amended, that a histological diagnosis can now be made much earlier in the disease than formerly, and in many instances a correct clinical diagnosis of early breast carcinoma can be made on certain physical signs alone, even before there is a palpable tumour. Further, the growing practice of making serial sections of all the material removed, and not merely of the predominating focus, has been so illuminating that it is now frequently possible to demonstrate in a direct sequence the evolution of breast cancer from benign cystic and papillomatous lesions. These advances have opened up new possibilities, not only of more effective treatment but of prevention as well.

In speaking of the breast some pathologists now use the term "primary tumour" or "primary focus of malignant disease" to designate a growth which has not yet trespassed beyond the normal confines of the tissue in which it originated, and look upon the palpable tumour in which infiltration is histologically evident as the secondary stage, and upon lymph-gland involvement as the tertiary stage or stage of dissemination. In other words, a diagnosis of cancer can now be made without histological evidence of infiltration.

In the past too much stress has been laid upon the morphological characteristics of the cell and too little upon the possible biological trend. Speaking generally, it may be said that slight morphological changes in the cell imply marked biological changes, although, on the other hand, biological changes may undoubtedly be initiated and may progress without reflection in the cell morphology. Unfortunately, we have as yet no biochemical or other method of detecting these biological changes in their early stages.

As a rule cystic disease of the breast develops between the ages of 25 and 35; papilloma formation (benign neoplasia) supervenes during the

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next decade, that is, between 35 and 45; and malignant neoplasia becomes manifest between 45 and 55. It should be borne in mind, however, that these age incidences show many variations, and that in malignant neoplasia the exceptions are almost always in the direction of youth rather than of middle or old age. But, however variable the age incidence, and even though from 15 to 30 years elapse between the appearance of the benign cyst and the development of the malignant neoplasm, there can be no doubt that there is a direct connection between the two. While it is not known what percentage of cystic cases ultimately become malignant, it has been conservatively estimated that 20 per cent of carcinomata of the breast have their beginnings in precursory cystic and papillomatous lesions. In this knowledge one finds some ground for hope, because, if the profession can but bring itself to realize the seriousness of the menace which, however remote, lies in these apparently benign lesions, and to see to it that all such cases are adequately investigated and treated in the early stages, the number of fatalities from carcinoma originating in them may be greatly reduced.

HISTORICAL REVIEW

In Sir Benjamin Brodie's paper[2] on "Benign Cystic Disease", published in 1846, the clinical and pathological aspects of this condition are described. It was Sir Benjamin's view that cyst formation took place primarily in the milk ducts. Reclus' description[9] of the condition, in 1883, under the name "Maladie kystique des mamelles" (Reclus' disease), corresponds in some degree to the modern description by Cheatle under the name "cystiphorous desquamative epithelial hyperplasia". Reclus stresses two important features of the disease — the formation of multiple cysts and the frequency of bilateral involvement. One must mention also Schimmelbusch's paper,[10] "Das Cystadenom der Mamma" (Schimmelbusch's disease), which appeared in 1892 and embraces not only cystic disease with epithelial hyperplasia and desquamation but papilloma formation as well.

Buried in the Transactions of the Pathological Society of London for 1901 is an article by Paul,[8] in which he states his conviction, founded upon clinical experience, that the epithelial hyperplasia seen in cystic lesions of the breast not infrequently ends in carcinoma. He also shows that benign neoplasia, as we now call it, is but an advanced stage of simple hyperplasia, and further that it is often the immediate precursor of cancer. So far as I know, Paul was the first to recognize the intimate connection between early cystic lesions of the breast and later malignant disease.

The most outstanding contribution to this subject since Paul's paper is that of Cheatle,[3] covering his clinical and pathological researches over a period of thirty years, and embodied in his recent publication entitled "Tumours of the Breast". Cheatle confirms all of the important statements of Paul upon the relation of cystic disease to carcinoma. He goes, however, much farther than Paul or Schimmelbusch or Reclus, and arranges in a pathological sequence the various stages and processes which have hitherto been included, without much differentiation, under the names "Schimmelbusch's disease", "chronic cystic mastitis" or "chronic mastitis."

MAZOPLASIA

Under the term "mazoplasia", which he regards as being a physiological rather than a pathological condition, Cheatle segregates a number of cases which were formerly listed under the all-inclusive term "chronic mastitis". Mazoplasia is characterized clinically by tenderness in one or both breasts; by pain, frequently unilateral and sometimes severe, especially during menstruation; and, where the subcutaneous fat of the breast is scanty, by a granular feel. In many cases the menstrual flow is diminished. Mazoplasia may occur in infancy, at puberty, during pregnancy, or during lactation (in latent parts of the breast), and it is usually found to some extent in the breasts of all women who have lactated, especially those between the ages of 30 and 40. Symptoms disappear at the menopause. It occurs also in the male breast. Treatment consists in the support of the breasts without compression, the avoidance of excessive use of the arms, and the administration of ovarian residue, if the menstruation is scanty.

Mazoplasia, it is thought, never leads to carcinoma, and but rarely to the formation of fibro-adenoma. Histologically, it is characterized by (1) simple epithelial desquamation, leading to some distension of the terminal ducts and alveoli, but not to the formation of cysts or papillomata; and (2) by hyperplasia of the periacinal and periductal connective tissue.

CYSTIC LESIONS

We now come to cystic disease proper. Here we must shed the inaccurate term "mastitis", which wrongly imputes to inflammation an important rôle in this affection. The term "chronic cystic disease" is preferable. We must also correct the habit of thinking of cystic disease as an atrophic or regressive change in the breast coincident with the decline or arrest of the menstrual function, because, as a matter of fact, cystic disease develops in the late twenties or during the thirties, long before the approach to, or the establishment of, the menopause.

Cysts of the breast have their origin in the acini and terminal ducts; are single or multiple, and may involve one or both breasts. Solitary cysts are manifested clinically as globular elastic swellings, freely movable within the breast tissue; multiple small cysts usually form a triangular area of nodularity with the base toward the periphery of the breast. In the larger cysts fluctuation may be elicited. Serous discharge from the nipple may occur from time to time, with coincident subsidence of the swelling. On transillumination there is no opacity. Pain may be a marked feature, especially at the menstrual period, but commonly it is absent. If the cyst is tense, deep-seated, and fixed it may suggest carcinoma, but in benign cystic disease there is no retraction of the nipple or stippling of the skin, the tumour is translucent, and the axillary glands are not involved.

Because of atrophy due to pressure, the lining epithelium of large single cysts seldom progresses to papillomatous or malignant change. The most menacing cystic state is that of fine nodularity; it is usually in these smaller cysts that carcinoma develops.

Large cysts should be aspirated, the fluid centrifugalized, and the cellular residue examined for tumour cells (in smears and after fixation). The aspirated fluid is clear serous, grey and turbid, or greenish-grey. Should the histological examination show the presence of cancer cells, a radical operation should be performed. Otherwise, nothing more need be done at the time; but, because of the frequent presence of small marginal cysts in which carcinoma may develop later, the patient should be kept under supervision.

In the treatment of the finely nodular cystic areas the only safe methods are (1) in younger subjects wide segmental resection and subsequent examination of serial sections, with a secondary radical operation should a focus of malignant change be found; and (2) in older subjects a primary radical operation, or at all events a complete mastectomy. Cheatle regards these cases with grave concern, and reports six consecutive cases of local nodularity (without other signs of carcinoma) in which, after radical operation, the histological examination revealed neoplasia superimposed upon cystic desquamative hyperplasia, the neoplasia being in only one case confined to normal limits. In two of the cases metastases were found in the axillary lymph nodes (as in Case 1).

Paul and Cheatle both insist that carcinoma is especially likely to develop in cases of bilateral cystic disease. In such cases the danger of ultimate malignant change is necessarily doubled. I have met with several examples of this type; in each case unilateral segmental resection or simple mastectomy was performed between the ages of 35 and 45, the microscopical examination showing simple cystic disease, and within the next decade carcinoma developed in an area of cystic disease in the opposite breast. (See Case 5).

In the early stages of cystic disease one finds, histologically, hyperplasia of the lining epithelium, with desquamation and death of the cast-off cells—a purely benign process, unaccompanied by hyperplastic changes in the periacinal or periductal connective tissue. The disease may never progress beyond this stage. But, in certain cases, with the passage of time, or through the action of an irritant, the nature of which is yet unknown, a change becomes evident in the biological status of the epithelium; cell is piled upon cell, until the whole lumen of the cystic cavity becomes filled with viable cells which retain their normal staining properties. This is the stage of benign neoplasia. But it is only a short step from this benign stage to the stage of uncontrolled malignant neoplasia. It is invariably in such a focus of benign neoplasia that the invasive process (a visibly malignant process) has its beginnings. If the cells outside the cyst wall are indisputably carcinomatous, those occupying the breach in the cyst or ductal wall, being their immediate progenitors, are also malignant, as are also those cells within the cyst or duct which, in a still earlier stage, gave rise to the cells which initiated the invasive process.

PAPILLOMATOUS LESIONS

A more frequent form of benign epithelial neoplasia, and one with a yet greater tendency to malignant change, is the papilloma. Papillomata develop within the ducts between the ages of 35 and 45, in many instances probably in pre-existing small ductal cysts which have been the seat of desquamative hyperplasia. They may be single outgrowths with a well-formed stalk derived from the periductal connective tissue, containing strands of the elastica; more commonly they are multiradicular. In the composite form especially the branching filaments coalesce and the epithelium forms new acini, these glandular formations having given rise to the term "papillary cystadenoma". The multiple minute papillomata so often seen in the walls of acinar cysts are supported by the sub-epithelial connective tissue only, and, although they are, strictly speaking, neoplastic elements, they disappear as the cyst enlarges and do not lead to malignant changes.

As in the stomach and colon, papillomatous growths in the breast tend to become malignant; but, although the lesions are frequently multiple, only one as a rule undergoes malignant change. Here again the analogy to the course of papillomatosis of the intestinal tract is seen. Further, in the breast, as in the bowel, malignant change begins at the base of the stalk. In the breast it spreads in both directions along the ductal wall, the cancer cells detaching the columnar layer of epithelial cells from the basement or myo-epithelial layer — the inter-epithelial mode of extension described by Muir[7] and Masson,[5] the latter under the term "epitheliotropism."

In association with, and of even greater pathological significance than, the pedunculated form of papilloma, sessile epithelial neoplasias may occur, devoid of connective-tissue elements. Here the variations in the morphology of the cells and the lack of the orderly arrangement seen in pedunculated papillomatous growths indicate the biological trend toward malignant neoplasia. Case 2 is an example of this form of sessile papilloma.

The most positive clinical sign of papillomatous disease is the intermittent discharge of blood or bloody serum from the nipple, the discharge coming usually from one duct only. Associated with this there may be merely a feeling of discomfort, or there may be pain, which at times is severe owing to the sudden distension of the duct with blood. The importance of pain or discomfort as a symptom lies in the fact that it draws attention to the breast. Palpation usually reveals the presence of a localized swelling in the breast, in the area where the pain has been noted; and, in cases in which bleeding from the nipple has been a symptom, pressure upon this swelling will induce further serous or bloody discharge (Case 1). There may, however, be bleeding from the nipple without a palpable mass (Case 2). The fact that a mass is not felt does not detract from the seriousness of the case or offer any surety that ductal carcinoma is not present, even widespread. My own observations lead me to believe that a clinical diagnosis of carcinoma can be made with certainty if, in addition to the presence of a bloody discharge, on careful palpation of the nipple, a thickening can be made out in the line of the duct from which the discharge has come. Personally, I have not noticed this thickening in cases in which the discharge was purely serous or in those in which the breast was proven on serial section to be free from carcinoma. In two of the cases which I have to report (Cases 1 and 2), there was ductal thickening, which was found to be due, not to the replacement of the columnar ductal epithelium by cancer cells, with an accompanying periductal lymphocytic infiltration, as is the case in Paget's disease, but to simple desquamative hyperplasia of the ductal epithelium, the result of irritation either from the cancer in the periphery of the duct or from the presence of blood.

In considering the treatment of this affection one must give weight to (1) the age-incidence, ranging as it does from 35 to 45, the average being 40 or over, that is to say, an age-incidence which coincides with the climacteric and the accepted "cancer age"; and (2) the statements of Adair,[1] Judd,[4] Miller and Lewis,[6] that in their researches carcinoma has been demonstrated in approximately 50 per cent of the breast cases operated upon in which bleeding from the nipple was a symptom.

While in selected cases wide local excision may be justifiable, it is always attended by risk, because one cannot be sure that the particular papilloma removed was the cause of the bleeding or that there is not malignant change in other similar lesions situated elsewhere in the breast. My own feeling is that a breast from which bleeding has occurred should be removed, and

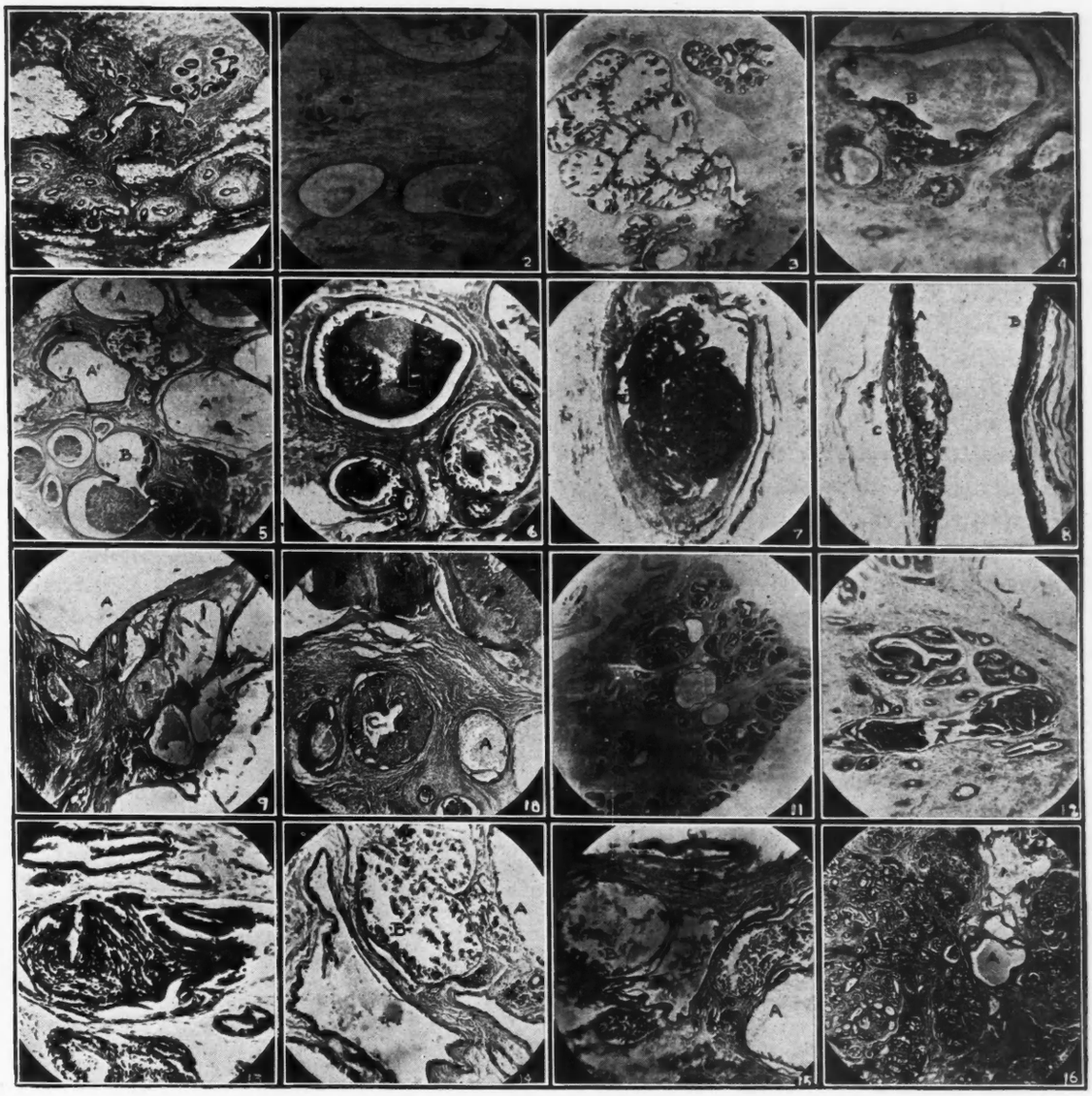

FIG. 1.—Mazoplasia. Section from male breast showing (1) hyperplasia of ductal and acinar epithelium with slight dilatation, but no cyst formation; (2) diffuse hyperplasia of periductal and periacinal connective tissue.

FIG. 2. (Case 1).—Simple cysts.

FIG. 3. (Case 1).—Cysts showing epithelial hyperplasia with numerous small papillary tufts.

FIG. 4. (Case 1).—(A) Simple cyst. (B) Dilated duct with malignant epithelial neoplasia.

FIG. 5. (Case 1).—(A-A′-A″) Simple cysts. (B) Benign neoplasia. (C) Malignant neoplasia.

FIG. 6. (Case 1).—(A) Duct containing blood. (B) Malignant neoplasia in duct with infiltration of its wall. (C) Permeated lymphatics.

FIG. 7. (Case 2).—Dilated duct containing degenerated papilloma.

FIG. 8. (Case 2).—Vertical section of duct from which bleeding occurred, showing (A) sessile malignant papilloma; (B) marked hyperplasia of epithelium on opposite side of ductal wall, but with desquamation; (C) periductal lymphocytic infiltration beneath the neoplastic area.

FIG. 9. (Case 3).—Showing (A) simple cyst; (B) alveolus containing blood; (C) malignant neoplasia filling duct.

FIG. 10. (Case 3).—Showing (A) simple desquamative hyperplasia; (B) multiradicular malignant papillary cystadenoma; (C) duct filled withactively growing cancer cells.

FIG. 11. (Case 4).—Simple cysts and diffuse alveolar epithelial hyperplasia.

FIG. 12. (Case 4).—Diagonal section of duct showing (A) malignant epithelial neoplasia.

FIG. 13. (Case 4).—High power of Fig. 12 showing complete destruction of ductal columnar epithelium, but without involvement of the basilar myo-epithelial layer. Malignant neoplasia confined within normal anatomical limits. A good example of a primary tumour.

FIG. 14. (Case 5).—Showing (A) simple cyst; (B) desquamative epithelial hyperplasia.

FIG. 15. (Case 5).—Showing (A) simple cyst; (B) early epithelial neoplasia with desquamation; (C) duct filled with neoplastic cells.

FIG. 16. (Case 5).—Showing diffuse adenocarcinoma with (A) alveolar cyst.

that, if the bleeding is associated with ductal thickening, the axilla should be dissected also.

Statistics on these subjects of early malignant neoplasia and the association of cancer with bleeding from the nipple will be stabilized only when all pathologists adopt the practice of making serial sections of the whole breast or of all the tissue removed in segmental resections.

For a number of years Dr. Laurence J. Rhea, pathologist to the Montreal General Hospital, has examined clinically all patients with breast lesions admitted to my service, and has passed upon the frozen sections made at the time of operation and upon all the serial sections prepared from the surgical material. Owing to the thoroughness of this pathological investigation, many early foci of cancer which were unsuspected clinically and invisible on gross section have been discovered.

The following reports have been selected to illustrate the clinical and histological features of cystic and papillomatous disease which has ended in malignant neoplasia. They are accompanied by photomicrographs prepared by Dr. Rhea, depicting the various stages in the transition from simple desquamative epithelial hyperplasia to carcinoma.

CASE 1

(No. 4408), Mrs. R., aged 46, admitted on August 5, 1932, complaining of a lump in the left breast with bleeding from the nipple.

Clinical history.—Three normal pregnancies. With each period of lactation she had been troubled with cracked nipples and congestion of breasts. Menopause occurred at 42. She received antiluetic treatment from October, 1928, until June, 1932. From time to time during the two months prior to admission the patient had noticed a bloody discharge from the left nipple. Two weeks before admission a lump was discovered in the left breast, and it was for this rather than the bleeding that the patient sought advice.

Physical examination was negative, apart from the local breast condition and a four-plus Wassermann. The breasts were symmetrical, of moderate size, and pendulous. The subcutaneous fat was scanty. In the mid portion of the outer half of the left breast was an irregular nodular mass, the nodules varying in size from 0.5 to 1.5 cm. in diameter. The area of nodulation was segmental in outline, with its base toward the margin of the breast. The consistence of the nodules varied from elastic to firm, the latter term applying to the smaller peripheral nodules. The tumour as a whole was not movable within the breast tissue. It was not tender. The overlying skin was not attached. There was no retraction or fixation of the nipple. On compression of the breast bloody fluid escaped from one of the ducts, and when the nipple was rolled between the thumb and forefinger this duct could be distinctly felt as a thickened cord. On transillumination there was no definite opacity. There was one firm axillary node, 0.5 cm. in diameter.

Clinical diagnosis.—Chronic cystic disease and carcinoma, based upon (1) the presence of an ill-defined and irregular mass in the breast (chronic cystic disease); (2) bleeding from the nipple (neoplasia); and (3) palpable thickening of the duct from which the blood escaped.

Treatment.—Radical operation.

Pathological report.—On gross section nothing suggestive of carcinoma was found. Microscopical examination of serial sections, however, showed (1) chronic cystic disease; (2) duct-carcinoma; (3) a small focus of carcinoma in one of the six axillary lymph nodes examined.

Comment.—This case is a typical example of the development of carcinoma in a benign cystic lesion. The serial sections from different parts of the breast showed the presence of, (1) simple cysts with desquamative hyperplasia of the lining epithelium; (2) cysts showing advanced hyperplasia, the epithelial lining being several layers in thickness (benign neoplasia); (3) cysts showing partial to complete replacement of lining epithelium by cancer cells (malignant neoplasia); (4) cysts showing breach in basement membrane and infiltration of surrounding tissues; (5) ducts filled with cancer cells; (6) lymphatic permeation; (7) lymph-gland invasion.

CASE 2

(No. 7391), Mrs. M., aged 57, was admitted on December 27, 1931, complaining of bleeding from the right nipple.

Clinical history.—Seven miscarriages; no full term pregnancies. No injury or inflammation of breasts. Menopause occurred at 51. Systolic blood pressure 200 to 220 during the previous four years. Bleeding from the right nipple occurred for two weeks prior to admission.

Physical examination.—Obese. Blood pressure, 220/110. Enlarged heart; aortic accentuation. Urine normal. The breasts were very large, pendulous, and symmetrical; no mass was palpable in either. The nipples were erectile and normal in appearance. On compression of the right breast blood escaped from the central duct, and, when the nipple was rolled between the thumb and forefinger this duct could be felt as a distinct cord, extending from the surface of the nipple directly into the underlying breast tissue. There were no palpable axillary lymph nodes.

Clinical diagnosis.—Early ductal carcinoma, based upon the clinical signs of (1) bleeding from the nipple, and (2) palpable thickening of the duct from which the blood escaped.

Treatment.—Simple mastectomy with exploration of the floor of the axilla for possible lymph gland involvement. Apart from the patient's objection to radical operation, the more conservative treatment seemed justified in view of the cardio-vascular condition and the absence of a palpable breast tumour.

Pathological examination.—To maintain normal alignment, a piece of fine bronze wire, doubled, was passed down the thickened duct at the time of operation. The whole breast was fixed and then sliced, and from these broad slices serial sections were cut. In the sections from the central block, which included the whole width of the nipple, there was found microscopically, beneath the base of the nipple, a small ductal cyst containing a necrotic papilloma; deeper in the breast slight cystic dilatation of the ducts was found, with epithelial hyperplasia; and in the central duct, which was dilated and palpable, a minute sessile carcinoma (Fig. 8). This was the only focus of malignant disease found in many series of sections prepared from different parts of the breast.

Comment.—Here, as in Case 1, the clinical diagnosis of cancer was made upon the associated signs of bleeding and ductal thickening, the latter sign being the more positive indication.

The two following cases are examples of malignant change occurring in cystic lesions at an earlier age. They illustrate, too, the fact that in many instances a correct diagnosis can be made only upon histological examination.

CASE 3

(No. 522), Miss C., aged 30, was admitted on January 27, 1932, complaining of a lump in the right breast and blood-stained serous discharge from the nipple.

Clinical history.—At the age of 14 the patient first noticed a lump in the right breast. During the intervening 16 years the tumour had gradually increased in size. For two weeks prior to admission a serous discharge from the nipple, at times blood-stained, had been noticed.

Physical examination was negative, apart from the breast condition. The breasts were of medium size, not pendulous. The nipples were normal and on the same level. In the mid-line of the right breast, below the margin of the areola, was an oval tumour, 2.5 by 3.5 cm., firm in consistence, insensitive, and freely movable within the breast tissue. There was no attachment of the overlying skin. When the breast was compressed, serosanguineous fluid exuded from the nipple. There was no palpable ductal cord. Transillumination showed an opaque shadow. The patient was examined by Dr. Rhea also, and, although the firmness of the tumour and the bleeding from the nipple suggested the possibility of cancer, the patient's age, the prolonged history of tumour (16 years), and its evident encapsulation, led to an agreed diagnosis of fibro-adenoma.

At operation the tumour was explored and readily shelled out of a well-defined capsule. On gross section at the table Dr. Rhea again concurred in the provisional diagnosis of benign neoplasm. Immediate frozen sections, however, showed that the lesion was wholly carcinomatous. A radical breast operation was performed.

Histological examination of serial sections showed the tumour to be a malignant papillary cystadenoma, with invasion of the surrounding breast tissue at one point. Sections from several small axillary lymph nodes showed no metastases.

Comment.—Cheatle reports similar cases of encapsulated, freely movable, malignant breast tumours.

CASE 4

(No. 5673), Miss M., aged 30, was admitted on October 2, 1930, complaining of a lump in the right breast.

Clinical history.—Two weeks before admission a lump in the right breast was noted. There had been no discharge from the nipple, no pain.

Physical examination.—Negative apart from the breast condition. The breasts were small and symmetrical; nipples normal. In the right breast there was a small area of nodulation. The nodules varied in size from 0.5 to 1.5 cm. and were freely movable and elastic on compression. On transillumination there was no shadow.

Clinical diagnosis.—Cystic disease.

Treatment.—Exploratory incision and removal of the segment of breast containing the nodules. On gross section several small smooth-walled cysts were exposed. Again a provisional diagnosis of simple cystic disease was made. However, in the immediate frozen sections, Dr. Rhea found definite malignant neoplasia in the smaller nodules about the periphery of the mass, and advised radical operation. As the patient had refused permission for more than a segmental resection, the radical procedure was postponed until routine sections had been prepared. These confirmed the earlier diagnosis of malignant neoplasia engrafted upon chronic cystic disease. The serial sections showed simple epithelial hyperplasia with desquamation, papillomatous neoplasia, and malignant neoplasia, without infiltration of the periacinal or periductal tissues. A radical operation was then performed. The serial sections of the whole breast and of the axillary nodes made after the radical breast operation showed no other pathological changes.

Comment.—In this case the preliminary segmental resection would possibly have proved curative. Undoubtedly in many cases of cystic disease which have been treated by simple segmental resection, but in which histological examination has not been made or has been limited, early malignant disease has existed and yet recovery has been permanent. On the other hand, one sees from time to time cases in which clinical cancer has subsequently developed at the site of a partial resection. If one accepts as unequivocal evidence of carcinoma an area of malignant neoplasia, however circumscribed, a radical operation should unquestionably be performed, in spite of the fact that in many cases time has proved that segmental resection may be curative. Only radical operation can yield the maximum percentage of permanent cures.

The following case is an example of bilateral cystic disease in which segmental resection in one breast (performed for the cure of cystic disease), was followed later by the development of carcinoma in the other.

CASE 5

(Western, No. 367), Mrs. McK., aged 46, was admitted on March 15, 1933, and seen in consultation with Dr. Howard Reilly, to whom I am indebted for the pathological material. The patient complained of a lump in the right breast.

Clinical history.—In February, 1929, a segmental resection of the left breast was performed for chronic cystic disease (proved microscopically). Two years later the patient noticed a lump in the right breast. It did not increase in size. Pain had been a noticeable feature, especially at the menstrual period. There had been no discharge from the nipple.

Examination showed a segmental area of nodulation in the right breast, extending from the areola to the border of the breast. One nodule was quite firm in consistence; the others were elastic. The skin was unattached; the nipple, normal. Transillumination showed no opacity.

Clinical diagnosis.—Chronic cystic disease. A wide segmental resection was performed. Histologically, the tissue removed showed numerous cysts, with epithelial hyperplasia and desquamation, and one small area of

adenocarcinoma, but no diffuse epithelial cell infiltration. In view of the unexpected histological findings a radical operation was performed later. There was no involvement of the axillary lymph nodes.

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THE RADIUM TREATMENT OF PRIMARY CARCINOMA OF THE BREAST*

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XIV

THERE are few departments of surgery in which practice has become so thoroughly standardized as in the treatment of carcinoma of the breast. The work of Halsted and his successors has grounded so securely the principle of operation, and the results have been relatively so good, that for many years there have been no two opinions as to how to deal with a carcinoma of the breast. The radical operation at the earliest opportunity has been universally accepted as the right and proper procedure. The position, in fact, is such that no one would light-heartedly attempt to upset established practice or to suggest that radical surgery is not after all the best means of dealing with a very common and very serious disease.

With the incursion of radium, however, into surgical practice ten years ago it was clearly necessary to ascertain what part might be taken by this newer weapon in the treatment of carcinoma of the breast. Our colleagues in the radiological clinics of the Continent of Europe have always maintained and still maintain that carcinoma of the breast cannot be treated by radium, and therefore that no attempt should be made to do so except in such cases as are surgically hopeless. This general position seems to have been largely determined by the belief that glandular epithelium is on the whole insensitive to irradiation, whereas squamous epithelium and its various modifications are relatively sensitive. This has resulted in a secure position for radiological methods in the treatment of malignant disease of the skin, tongue, buccal cavity, nasopharynx, larynx, anal orifice, vulva, and cervix uteri. But its position is very different in regard to malignant disease of the alimentary tract and all glandular organs, including the mammary gland. Objection to the use of radium in treating the breast is based additionally upon the alleged impossibility of treating adequately the whole area of possible infection, even excluding, that is, the obviously inaccessible areas of possible dissemination, such as the mediastinum and skeleton. With this general position I find myself for the most part in agreement, except in regard to treatment of carcinoma of the breast, and it is the rather unorthodox thesis, namely, the possibility of treating primary carcinoma of the breast by radium alone, or by radium coupled with conservative surgery, that I wish to examine.

It was clearly unjustifiable ten years ago to treat with radium any patient who was amenable to surgery, and a start was therefore made in treating only those who were obviously "inoperable". The term "inoperable" is capable of being interpreted in many ways. In the present connection it indicated at first those patients on whom the surgeons at St. Bartholomew's Hospital refused to operate, the patients being turned over to the Surgical Clinic under Prof. G. E. Gask with whom I was then working. From the beginning radium "needles" were used in preference to radon tubes or seeds, and the technique when fully evolved was as follows.

TECHNIQUE

The technique involves the treatment of two main areas: (1) the breast and primary growth; (2) the accessible lymphatic areas. This separation is made owing to the fact that whereas the

* Preceding articles in the series on Physiotherapy can be found in the Journal as follows:— 1932, **27:** 521, 612; 1933 **28:** 30, 182, 246, 392, 602; **29:** 167, 290, 402, 497 and 502.

lymphatic areas require an almost constant amount of radium, the amount required for the primary growth is very variable. Two or three times as much radium may be needed for a large breast in a stout patient as for a small contracting growth in the breast of a thin patient. It is therefore impossible to lay down rules for dosage. Any statement that so many milligram-hours is the correct standard would be entirely misleading with so variable a factor in the calculation. The only rough guide that can be given is the empirical observation that the best results seem to be obtained in the breast by using needles of 3 mgrm. in an active length of 4-8 cm. with a filtration of 0.6 or 0.8 mm. platinum, placed about 1.5 cm. apart (Fig. 1).

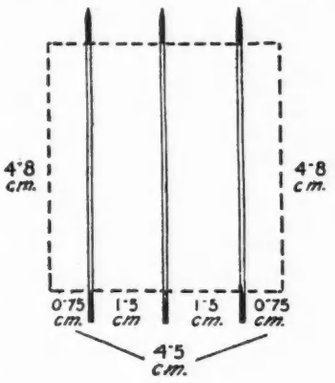

FIG. 1

That is to say, for an area of breast 4.8 x 4.5 cm. (21.6 sq. cm.), 9 mgrm. of radium will be required, or approximately 1 mgrm. for each 2.5 sq. cm. of breast. This calculation takes no account of the thickness of the tissue to be treated, and sometimes in a stout patient additional needles have to be inserted in another plane, nearer the surface. Experience is the best guide in this matter, for an overdose may result in very unpleasant consequences for the patient. It has been my practice to insert the needles as far as possible in a plane deep to the growth, usually in fact under the deep surface of the mammary gland itself—that is, in the plane of the pectoral fascia. My reasons for this have been several.

1. Pushing needles into the growth itself or even into its immediate surroundings has appeared to me to involve the risk of transplanting carcinoma cells into tissue previously uninfected. The ends of the needles are very feebly radioactive, so that any cells carried on the point will not be effectively irradiated.

2. Needles introduced into the sometimes poorly nourished tumour tissue may exert too intense a local effect, with risk of subsequent necrosis. Radium treatment can usually be made effective without necrosis and its attendant discomforts to the patient.

3. The main lymph channels draining the breast run in this plane deep to the breast.

4. The skin, being very susceptible to burning by radium, is liable to be injured unless screened by the breast tissue from the rays.

5. The breast tissue is often extremely tough, and needles may easily be damaged if any force has to be used while inserting them.

6. Experience has shown that when the mammary gland is not too thick an entirely satisfactory result can be obtained by this deep irradiation, sometimes without skin-burning or other disadvantage.

When the tumour or the breast is large I have sometimes departed from this principle by inserting additional needles more superficially, though these are usually in the neighbourhood of the growth rather than in it.

The needles are disposed as evenly as possible, sometimes in a cartwheel fashion, sometimes covering a quadrangular area. The error of covering an insufficient area of breast surrounding the primary tumour must be avoided. It is particularly important not to leave a gap of untreated breast between the tumour and the anterior wall of the axilla.

Sometimes the series of needles is continued under an area of skin in the neighbourhood of the breast, particularly towards the mid-line, if there is any suspicion of nodules spreading there. A much larger area than that actually occupied by palpable nodules must be irradiated. (Fig. 2).

The accessible lymphatic areas are all treated in accordance with the known channels of lymphatic drainage of the breast. It is a matter of common observation that in the great majority of patients the axillary glands are the group to be first infected with secondary growths, and it is reasonable to infer that carcinoma cells, whether they spread by multiplication in continuity, by active movement, or by embolism, take the line of least resistance—that is, towards the axilla in the first place. The treatment of the subpectoral lymphatics and of the axilla is therefore of the first importance and must never be omitted. This is best effected by the long

needles (3 mgrm. in 4.8 cm. active length) inserted beneath the pectoral muscle and, in continuity, into the axilla. Those in the axilla are placed on each wall in turn, four or five being placed so as to converge towards the apex. These can be placed with great accuracy through punctures in the skin, though care must be exercised not to pierce the pleural cavity by the needle on the inner and posterior wall, and not to injure vessels or nerves by that on the outer wall. The latter structures are safeguarded by keeping the upper arm abducted at a right angle from the body and inserting the needle in a direction parallel to the position of the neurovascular bundle and not too close to it.

The third lymphatic area for needles is the infraclavicular. It is not uncommon, when operating for carcinoma of the breast, to find enlarged glands running up from the axillary group over the costocoracoid membrane to a position almost behind the clavicle. Needles are therefore inserted below and more or less parallel to the middle third of the clavicle. Except in very stout patients there is not room for the long needles, and it is better to use two or three needles each containing 2 mgrm. in an active length of 3.2 cm. These are inserted through skin punctures and are directed towards the axilla, but are plunged at first almost directly backwards so as to pierce the pectoral muscles. Their points should lie close to those of the needles in the axilla so that they may contribute to the irradiation of the apex of the axilla. Their radiations will also pass backwards to the costo-coracoid membrane and upwards behind the clavicle.

The fourth lymphatic area is the supraclavicular. The glands in this area are commonly the next ones to become enlarged after the axillary glands. Occasionally they are affected before anything is palpable in the axilla, suggesting that there are some lymphatic channels passing directly upwards from the breast to the supraclavicular region without visiting glands in the axilla. Sometimes enlargement of these glands is undoubtedly due to an extension upwards of the disease from the mediastinum, in which case radium treatment is unlikely to be of any avail; but it is seldom possible to be certain of this, and the supraclavicular group is certainly to be included in the routine treatment, thus extending the treatment beyond what is usually attempted by surgery, in spite of Halsted's earlier attempt to remove them. The needles, usually two or three of the shorter kind, are inserted through skin punctures from within outwards, parallel to the middle third of the clavicle. They should be plunged at first backwards through the deep cervical fascia so as to pass behind the posterior part of the sternomastoid muscle and the external jugular vein. They then enter the loose areolar tissue at the root of the neck, and no force should be necessary to get them into position. If they are passed too deeply backwards, they will injure the brachial plexus, or if too much downwards may pierce the subclavian vein. If no force is used, neither of these accidents will occur.

The fifth lymphatic area includes the upper four intercostal spaces. During the "following-up" of several hundred patients treated for carcinoma of the breast by surgery or radium in the course of the last eleven years I have never seen an intercostal recurrence traceable to one of the internal mammary lymphatic glands. Yet great stress has been laid upon the possibility of this event by Sampson Handley, and I have followed his lead during the last four years by inserting radium needles into at least the upper three intercostal spaces in most patients. It is very dangerous to use long needles in this position, and the skin punctures must be made at a sufficient distance from the edge of the sternum. A needle of 2 mgrm. in 3.2 cm. active length is then pushed in very obliquely between the ribs, and the point must be felt to impinge on the lateral border of the sternum. The needle is then partly withdrawn and pushed in again slightly deeper so as to pass just behind the edge of the sternum. It should not project more than 1 cm. into the anterior mediastinum. If the needle is kept in this way very close to the sternum, it will not be in danger of injuring the pleura, pericardium, or internal mammary artery, though it will be in close proximity to the internal mammary gland. Any misjudging of the position of these needles may result in the loss of the patient's life.

A distribution of needles as described above will require up to about 100 mgrm. of radium element distributed as follows:—

10 needles 2 mgrm. Ra. each, 3.2 cm. active length
25 " 3 " " 4.8 " "

The thickness of the platinum cases should be at least 0.5 mm., and it is probably better to

have 0.6 mm. or even 0.8 mm. With the greater thickness virtually the whole of the β radiation is removed, so that the needles may be left in position for longer periods with less fear of damage to normal tissues. It is also a considerable gain to have the additional strength of the thicker needle when the tissues are tough.

Each needle is threaded on a strand of thick salmon gut, which has a single knot about 2 cm. from the eye of the needle. If the knot is close to the eye, the extraction of the needle is rendered more difficult. Salmon gut is used in preference to any form of thread because it is non-absorbent, so that the punctures in the skin remain more completely aseptic than if silk is used, whether carbolized or plain. The salmon gut does not crack if it is kept moist for twenty-four hours before use. The strands of salmon gut are knotted together in groups of four or five, thus guarding against loss of any one needle should it be accidentally pulled out of the tissues. The knotted strands are wrapped in gauze to prevent irritation of the skin, and the whole area is covered with adhesive rubber strapping as a further safeguard against displacement or loss of needles.

The needles are usually left in position for a period of 7 days (168 hours). It has been found empirically that this period of irradiation gives satisfactory results with the dosage employed, and from the point of view of hospital organization a 7-day period is the most convenient arrangement. It has also been found that this exposure very seldom produces necrosis of the tumour. The skin not infrequently shows a superficial burn, which is satisfactory evidence that the irradiation has penetrated the tissues. Occasionally, with a stout patient, it may be advantageous to increase the period to 8, 9, or even 10 days, but it should scarcely ever be reduced to a shorter period than 7 days.

While the needles are in position the patient should be kept in bed and the arm on the affected side should be at rest, though it need not necessarily be kept in a sling. Most patients suffer but little pain except on movement; some of them complain of nausea while being irradiated, or may even vomit occasionally.

The needles are usually inserted under gas and oxygen anæsthesia. The operation is brief, and the patient suffers the minimum of disturbance with this anæsthetic. Removal may be effected in the same way, though a general anæsthetic is not an absolute necessity. Usually most of the needles can be extracted without any anæsthetic at all, and for those that are caught up in the subcutaneous tissue a few minims of novocain solution injected round the skin puncture is all that is needed.

After removal of the needles the punctures heal very rapidly and leave but little trace, though usually there is just enough scar to serve as a useful indication of the precise area that has been irradiated. Should the skin reaction be excessive, the peeled area will have to be dressed for several weeks, liquid paraffin or some neutral application being the best.

FIG. 2. — Showing usual distribution of needles.

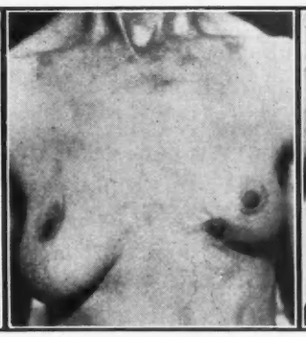

FIG. 3.—Before treatment.

FIG. 4. —Condition of the patient 5 years and 10 months after treatment.

My personal experience in the use of radium by this method, or of radium combined with surgery, in treating primary carcinoma of the breast extends to 240 patients treated over a period of eight years. The majority have been treated with radium alone; none of them has been subjected to the radical operation.

AFTER-CARE

It is very generally recognized at the present time that, by whatever method patients with malignant disease have been treated, it is of great importance to follow them carefully afterwards, so that the result of the treatment may be ascertained and further treatment instituted if necessary. With no type of disease is this principle more important than with carcinoma of the breast, for in treating unselected cases initial radium treatment cannot always be final;

further radium treatment may occasionally be called for, or surgery may be preferable. Radium cannot perform miracles when the disease is extensive, nor will it be found infallible even in favourable cases. These features it shares with other methods of treatment.

Immediately after treatment of the breast with interstitial radium needles there will be no appreciable change in the tumour. Shrinkage will usually be apparent within a fortnight, but a variable period, up to three or four months, will elapse before the full effect is obtained. Even then, results are not always easy to interpret, so that experience and good judgment on the part of the surgeon will be of great importance to the patient's welfare. In the most favourable event a tumour will completely disappear within three months and the breast will return to a clinically normal condition. Sometimes a fibrous residuum will persist and it will be difficult to know whether this contains active carcinoma or not. In such a case local excision of the residual lump is usually advisable. Occasionally fibrous tissue will form a year or more after the treatment, and this is particularly liable to occur in the axilla. This may give rise to uncertainty and lead to what may prove to be an unnecessary operation. But these difficulties in a proportion of the patients cannot at present be avoided. The results as a whole seem to justify the view that radium is a valuable weapon in treating the disease.

THE TREATMENT OF ADVANCED DISEASE

The effect of radium on advanced or obviously inoperable examples of the disease has been unexpectedly good. It is certain that a large proportion of the patients in this category will already have dissemination of the disease when they first come for treatment, but it so often happens that this cannot be detected that treatment must be given to many patients who will die within one or two years. Elimination of the local disease will often prevent much suffering.

Very favourable results have been obtained with fibrous avascular contracting tumours, which were inoperable owing to their being closely adherent to the chest wall. An example of this is shown in the accompanying figures. The patient was a woman aged 48, who had noticed a pucker in the left breast for two years. She had a hard mass, 5 by 2.5 cm., in the inner half of the breast, fixed to the chest wall. The whole breast was elevated and the nipple retracted. A hard enlarged lymph gland could be felt in the axilla. Radium treatment was given and 3½ months later both tumour and gland had disappeared. The patient is now, nearly six years later, without any recurrence or any signs of disease (Figs. 3 and 4). A number of similar cases could be described. Other patients with massive inoperable growths have been maintained in comfort for periods up to five years, or have been relieved of foul spreading ulcers.

The most recent series of figures for my patients in the "inoperable" category show that of 25 patients treated more than 5 years ago 8 are alive, and 7 of them are without signs of disease. One of these was treated 6½ years ago. More recently the survival rate has not been so good, apparently owing to there having been fewer patients with the contracting type of carcinoma.

THE TREATMENT OF EARLY DISEASE

It is clear, then, that radium treatment may offer an adequate and sometimes surprisingly effective treatment for patients in the later stages of carcinoma of the breast. At the other end of the scale are the patients whom all surgeons are eager to meet, namely those with a small localized tumour and no enlargement of lymph glands. The maxim at present in fashion for the treatment of this, the most favourable type of patient, is "the earlier the growth, the more radical the operation". With radium in our armamentarium it becomes legitimate to ask whether so drastic an attitude is any longer necessary, and I have, in fact, made so bold as to treat a number of these patients in the most conservative way. In many of them the disease was so early that only a small mobile lump, not easy to distinguish from a cyst or fibro-adenoma, has been present. It is justifiable, in my view, to carry out a local excision of such a lump with the electric needle, and, when the diagnosis of carcinoma is proved by microscopic section, to follow this by a complete radium treatment of the breast and lymphatic areas in the routine manner. Unnecessarily drastic operations are thereby eliminated, and to many women the saving of the breast is of the greatest psychological significance.

I have been able to place in this category 27

THE CLASSIFICATION OF THE PATIENTS

Class I.—Operable cases; no glands palpable; growth still apparently local.

Class II.—Operable cases; glands palpable, but no other indication of extension of the growth beyond the mammary tissue.

Class III.—Still operable, but the growth either adherent to the deep fascia, or the skin infiltrated or ulcerated, or metastases already manifest elsewhere; glands not always palpable.*

These classes correspond as closely as would seem possible to those taken in the analysis of patients treated by operation, the classification being based on *clinical* evidence only, as to the involvement of the glands.

TABLE SHOWING THE FATE OF PATIENTS IN EACH CLASS AT 3 YEARS AFTER THE TREATMENT

Class	*Total cases*	*Alive at 3 years*	*Died of intercurrent disease*	*Died of cancer Years after treatment*				*Percentage of survivors†*	
				0-1	*1-2*	*2-3*	*Total*	*Gross*	*Net*
I	37	26 (*a*)	2	1	6	2	9	70.3 (74.7)	74.3 (78.3)
II	29	15 (*a*)	2	0	7	5	12	51.7 (49.6)	55.5 (52.9)
III	21	6 (*a*)	2	7	3	3	13	28.6 (33.1)	31.6 (35.2)
Inop.	38	13	3	16	4	2	22	34.2	37.1

(*a*) In each of these there are two patients who were alive at 3 years but who either had died or were dying before reaching the 5 years after treatment.

†The percentages in brackets are those which were published by the Ministry of Health for the results of operative procedure the condition of the glands of the axilla being determined by clinical examination only for Classes I and II. (Ref. P. H. & Med. Subjects, No. 51, 1928. Table 23, p. 33.)

"Gross" denotes the percentage of survivors alive at the period named.
"Net" denotes the percentage of survivors alive at the period named but after deducting from the samples those dying of intercurrent disease.

of my patients, and the results so far obtained seem to justify my departure from established practice; all of these 27 are alive. One, a young patient, has had a supraclavicular recurrence, which has been treated with x-rays. One, after four years, has developed signs of general dissemination without local recurrence. Of the remaining 25, who are all without signs of disease, 12 were treated three years or more ago.

THE TREATMENT OF INTERMEDIATE STAGES

There remains the largest category of all—the patients with an operable carcinoma, not in a very early stage, but removable with a reasonable prospect of cure. In those most favourably situated there may be no lymph glands clinically enlarged, though even in many of these involvement of the glands would be discovered if they were to be examined histologically. It is improbable that any substantial advantage in favour of radium treatment in these patients will ever be demonstrated by statistical analysis. A large proportion of them will die from metastatic growths, whatever the form of treatment used, dissemination having taken place before treatment was instituted. There is, however, the possibility that, with a survival rate which is approximately equal for radium or radical operation, there may be other advantages on the side of radium. These seem to me to exist and to lie in the fact that many of the patients after radium treatment have virtually normal breasts, and in the complete absence of lymphatic œdema of the arm, not infrequently seen after the radical operation. It is no easy matter to assess relative advantages in this way, but there can be no doubt that in many women the prospect of an extensive operation is a very powerful factor in preventing her from reporting herself to her doctor in a comparatively early stage of the disease. It may be, therefore, that radium treatment may help indirectly in producing improved results by encouraging earlier treatment.

A statistical analysis of my material has been kindly undertaken by Lady Janet Forber (née Lane-Claypon), and the table for the results at three years is printed below. It will be seen that the figures for radium treatment approximate to the Ministry of Health figures for operative treatment. It would clearly be wrong at the present stage to claim that radium is the only treatment for carcinoma of the breast,

* It has been shown in Report No. 51, chap. 7, p. 27, of the Ministry of Health Report on P. H. and Med. Subjects, that in these advanced cases it is the extension of the growth outside the mammary gland which is of importance and not the condition of the axillary glands.

though I believe it has been demonstrated that, when circumstances allow, there is a very definite place for radium, either alone or combined with conservative, sometimes the most conservative, surgery. Whatever may be said on theoretical grounds as to the impossibility of properly irradiating the breast and its lymphatic drainage, it has been shown in practice that extremely good results can be obtained. The technique is not easy, and cannot be carried out without the proper radium containers, nor without due attention to detail. A fuller account of the method, with many case records and a consideration of the particular effect of radium on both the breast and the lymph glands, and of the difficulties and dangers that may be encountered, will be found in the *British Journal of Surgery*, 1932, **19**: 415.

TUBERCULOUS RHEUMATISM*

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THIS paper is devided into three chapters. The first is devoted to the question of doctrine such as developed by its author, Professor Poncet from Lyons, in 1908, at "La Société Médicale des Hôpitaux de Paris". From this paper large abstracts have been borrowed so as to maintain its originality, its credit, and in a way its prophetical visualization. This first part is chiefly concerned with an analytical or textual review. The second chapter is concerned with typical observations, one of which is personal, the others ancient or recent, published as personal by other authors. In the last chapter a discussion is brought up on this type of rheumatism, together with the several conclusions in accordance with those already published by preceding authors.

From the observations of the Lyons School of Medicine we know that tuberculous rheumatism exists, but we are surprised to find how very seldom it is diagnosed, how often it is confused with gouty or gonococcal arthritis. In spite of a few points of resemblance, its pathology, etiology, prognosis and treatment are so different that we should be able to identify it in every case. Not only clinically (the evolution is slow and not particularly obvious) but also experimentally, by the identification of the Koch bacillus in the articular effusion, we propose to demonstrate the true nature and origin of this disease.

PROOFS OF ITS EXISTENCE

Since all infectious diseases manifest signs of inflammation and may create a "rheumatism", tuberculosis, which is an infectious and inflammatory disease, must fall under the common rule.

Clinical proof.—Of all the leading laws of clinical medicine the most important and fruitful is unquestionably that of coincidence, according to which the various pathological phenomena encountered in a similarly infected patient depend on the same etiological infection, bearing in mind, of course, that there are rare exceptions. Thus, if in a subject contaminated with gonorrhœa, but free from all other infections, some spontaneous arthritic manifestation occurring should be regarded, *a priori*, as blennorrhagic, in the same manner, if an arthritis appears suddenly with apparently no reason in a tuberculous individual, tuberculosis should be held primarily responsible for it. We have the right and the duty, from the clinical standpoint, to draw such a deduction, as it is logical. Clinically, it is possible that rheumatism may appear to be primary, if the initial infection is latent, and its nature may be disclosed by laboratory methods only. How often are not tuberculosis and the tubercle bacillus to be found in the thoracic, medullary or abdominal ganglia of persons who did not during life present clinical signs of tuberculosis? On the other hand, from experimental methods of diagnosis, we have learned the greater importance of bacillary tuberculosis in palpable tuberculous lesions. Moreover, a patient may react typically to tuberculin and yet in the autopsy room show no gross or microscopic lesions of tuberculosis.

* Read at the Annual Meeting of the Canadian Medical Association, Saint John, N.B., June 22, 1933.

The practical deductions from these brief considerations are that an ordinary "rheumatism" may be the sole anatomo-clinical manifestation of a tuberculous infection, and that its nature may be made evident only by experimental procedures. Landouzy's typho-bacillosis is another example.

Observed facts can be connected with these rather theoretical abstractions. (Poncet).

1. It is possible to observe the appearance of typical fungous growths of rheumatic origin as a sequel of ordinary rheumatic fever. We have all learned to look with suspicion on those protracted rheumatic fevers which turn, one day or another, into a characteristic tumor albus. In these cases we have had to do from the first with a tuberculous process which has evolved into a tumor albus under the stimulation of a local virulence. Must we not discard the idea of "crossbreeding in the diathesis", that one infection makes way for another, or one bacillus for a second one? Pathology teaches us how often the morphology of a disease is inconsistent. Should we not keep in mind, as an explanation of an inflammatory process progressing from day to day, the known infection rather than the unknown? From a clinical standpoint let us accept as tuberculous the "rheumatic" inflammation which gradually turns into a tumor albus.

2. There are cases in which the alternation of true tuberculous lesions and rheumatic localizations is such as to compel the diagnosis of a unifocal infection of metastatic type. A case of cavernous tuberculosis, the cough of which was suppressed by a compound syrup, may be quoted in this connection. This patient, immediately after taking the remedy, was seized with violent pains in the right hip, causing him to be bedridden; and the hips, ankles and small articulations of the feet were successively involved with acute rheumatic inflammation. The exhibition of bromoform, in large doses, by hindering elimination, had obviously favoured the resorption of the bacillary secretions which were being eliminated before. This aberrant rheumatic patient took two months and a half to die. In many instances we have seen the bacillary localizations antagonizing one another, the lung faring well while the articulations are involved; and, conversely, we once saw a rheumatic arthritis suddenly relieved after the patient had had a severe hæmoptysis. One patient, also, was cured of an iritis on the inflammatory invasion of both the ankle articulations. These facts are too closely and simply related to give room for discussion. The hypothesis of a secondary infection is improbable, for bacteriological research gives no positive support for this in such cases. Connected with what we all know, these facts induce us to believe in the existence of a tuberculous rheumatism. We should, therefore, be on the lookout for it.

Experimental proof.—We are supplied with information having the precision of laboratory experiments. Observations have already been published concerning arthritic pains and acute synovitis following the subcutaneous injection of vaccine (Koch). First, we learn of a patient recovering from an astragalectomy for a fungous, suppurative osteo-arthritis of the tibio-tarsal articulation, who presented severe conjunctivitis as well as erratic rheumatoid pains after an ocular test. A tuberculin injection was given to another patient for purposes of diagnosis and a local reaction was registered in rheumatic articulations; pains in the joints appeared, swelling, dysarthrosis, where all was silent the preceding day. Professor Courmont, of Lyons, has seen intravenous injections of cutaneous tuberculous material, administered to rabbits, give rise to fungous arthritis, to synovitis, with riziform bodies, and to purely serous articular effusions. On the other hand, we know that at the autopsy of rabbits vaccinated against tuberculosis by repeated injections of homogeneous cultures, Professor Arloing once found a benign fungous arthritis, and in another case a hydropic synovitis, without the least sign of specific lesions. These facts, added to others derived from personal and general experience, demonstrate the existence of the tuberculous rheumatism, the experimental proof confirming the clinical.

Anatomo-pathological and bacteriological proof.—This chapter is probably the most interesting, on account of the various types met with, the multiple phases of the disease, and the discussions which are suggested. The observations can be classified under three heads, as follows:—

Tuberculous Rheumatism With a Specific Reaction

In these rare cases a granular eruption on the synovial membranes, sometimes associated with a fungous arthritis or a tuberculous pyo-

arthritis, is met with. This form has been known for long; we owe our recognition of it to Laveran who, long ago, observed a young soldier who died from an attack of acute rheumatic arthritis of the right knee, the autopsy showing a granular eruption on the synovial membranes.

Tuberculous Rheumatism without Anatomopathological Specificity, but with a Bacterial Specificity

In most cases the articulations involved in tuberculous rheumatism present no characteristic manifestations — follicle, giant-cell, or Koch bacilli—detected either by direct examination or by culture. The research carried on in our first observation proves this. All the joints were constantly negative, although inoculation in the same cases often gave positive results. With the bacteriologically negative liquid we can succeed in producing tubercles in guinea-pigs by subcutaneous or intraperitoneal injection. The demonstration in our case is presented in this paper.

Tuberculous Rheumatism Giving no Proof of its Nature Either by Pathological Anatomy or by Bacteriology

This is the usual case; we have only clinical signs to guide us. Here we have to do with very mild and changeable forms, figuring as ordinary rheumatism where a tumor albus is replaced by a rheumatic arthritis, or where the joints promptly react after an injection of tuberculin. From these facts arose the conception of an inflammatory specific tuberculosis, as set forth by the Lyons School of Medicine (Poncet especially—some sort of para-tuberculosis, producing only ordinary reactions in the tissues). This teaching, confirmed by experimentation, is nowadays unquestioned. Tuberculosis, according to Poncet, cannot be cramped in the narrow formula of the past. *We can no longer admit without reserve the classical conception of "specific" tuberculous follicles. Other agents, living or dead, may produce similar lesions, and the Koch bacillus may call forth a "simple" inflammatory process.*

We know that such structures as the pancreas, kidney, and endocardium react against the tuberculous invasion by means of ordinary multiple sclerotic lesions. The follicle (granuloma) would be "but the highest expression, the most differentiated, although not the exclusive one, of reactions due to the Koch bacillus." In some instances one can follow all the forms of transition between the most typical follicles and the most ordinary simple inflammatory lesions. Therefore, non-follicular lesions in tuberculosis exist, not differing from those produced by other infections, and manifesting:—

(*a*) *Vascular reactions* of the most common congestive type, as in erythema nodosum, as we have observed recently in a case at the Notre-Dame Hospital.

(*b*) *Reactions of the connective tissue;* embryonic infiltration in the diffuse connective tissues; sero-fibrinous exudations in the serous membranes; simple hyperplasia in the adenoid tissue, without any anatomical peculiarity; hierarchic succession in some experimental researches, from the common inflammatory exudate following bacillary inoculation to the cellular inflammation which will later on constitute the tuberculous follicle. These findings have been obtained in some cases of tuberculous rheumatism. *The Koch bacillus may therefore manifest its presence in the serous membranes by ordinary simple inflammatory lesions.*

A last article of this doctrine relates to its exact determining factors. How does the Koch bacillus take part in the toxic-infection of tuberculous rheumatism? Four hypotheses should be considered: (1) the action of diffusible toxins; (2) the action of adhesive poisons; (3) the direct action of the bacillus; (4) a filterable virus.

1. Can *diffusible toxins* give rise to inflammatory lesions similar to those met in tuberculous rheumatism? This has long been believed, because one refused to admit that the Koch bacillus could develop in the tissues without showing its presence by definite anatomical lesions. Here is the conception. Toxins are secreted by the bacillus in some part of the body, and are then thrown into the blood-stream; these toxins then locate in certain articulations, producing lesions which lack the customary characters of the bacillary ones but nevertheless are compatible with the idea of bacillary intoxication. This opinion is quite contestable, chiefly on account of the work of Fontes, of Rio de Janeiro, and A. Sergent, of Paris, on the filter-passing virus. We shall revert to this subject. The toxins carried to a distance are held to be incapable of producing such irritation of the tissues as

will give rise to "specific" lesions, because their action would be very weak and limited.

2. *The adhesive poisons,* isolated by Auclair, are the principal derivatives of the Koch bacillus. Extracted from the bacillus and injected into the tissues, they produce the anatomical features of tuberculosis. The ether extract excites caseous lesions; the chloroform extract produces fibrosis. The latter has little chance to progress, but may develop with giant cells, although there are degrees, and often it would be difficult to fix on any characteristic element. According to this hypothesis, tuberculous rheumatism would be a toxic rheumatism, the bacillus acting not by its soluble products but by its adhesive poisons.

It is objected, with reason, that adhesive poisons do not comprehend all tuberculosis, and that the facts do not always harmonize with this theory. The Koch bacillus undoubtedly possesses other poisons. In tuberculous rheumatism, as in some manifestations of "inflammatory" tuberculosis, the bacillus has rarely been met with. Very exceptionally, the exudates drawn from the articulations have rendered guinea-pigs tuberculous and infection appears two or three months after the inoculation. This hypothesis is, therefore, not entirely satisfactory.

3. *The direct action of the Koch bacillus* is a theory more generally accepted. One has to do with a bacillus the virulence of which is greatly weakened in the case of tuberculous and fibrous rheumatism. Arloing has been able to secure a human bacillus of little virulence for the guinea-pig and the rabbit, and one virulent form for the calf, by using cultures on potato and glycerinated bouillon. By inoculation he provoked in the organs tissue formations, the histology of which recalls early microscopical lesions. This author, then, favours the opinion that tuberculous rheumatism is a clinical type of this form of tuberculosis, experimentally produced. A transitory bacillæmia takes place, with colonization at some points where it gives rise to ordinary inflammation without the features of a specific reaction; tuberculous rheumatism would be a "microbic rheumatism". This is the opinion we support, adducing proofs in confirmation. Tuberculous rheumatism would fall into the category of the non-follicular lesions of tuberculosis, that is, it is an "inflammatory" (atypical, agranulomatous) tuberculosis caused by propagation of the bacilli in the tissues. These are isolated and distributed as units *in loco.*

4. *The tuberculous filterable virus* comes last, to strengthen our opinion. In a recent book, entitled "The reawakenings of pulmonary tuberculosis in the adult," Professor Sergent, of Paris, with his collaborator Duran, tells us how he succeeded in 1924 in isolating the tuberculous virus from the ground and filtered tracheobronchial ganglia of tuberculous persons. Following a series of most important experiments on this subject, where the presence of virus was observed in the exudate and in the articular effusions, Prof. Sergent discusses the multiple forms of the Koch bacillus in the ante-bacillary period and the dual nature of the virus versus the bacillus. He says, "One need not exclude the other." The detection of the virus alone in an exudate by no means excludes the presence of bacillary forms. Moreover, he finds that "One may already consider as true tuberculosis —in the infectious meaning of the term—states which were suspected of being related to the disease, but were conceived of as preparatory, when they were the signs of that disease." This period Sergent calls the ante-bacillary phase", clinically—but not biologically—speaking. Indeed, the accidents of this period must not be attributed only to the presence of the virus. The presence of the tubercle bacillus cannot, we repeat, be excluded, but in this phase it is rare and does not show up. "The clinical control", he adds, "often has revealed the intimate association of the bacillus and virus in tuberculous persons."

The rheumatic or other tuberculosis is caused by an infectious and polymorphous agent that may exist in different states, two at least of which are known in man—the filterable virus and the acid-fast form. Its penetration into the organism, hereditary, and transplacentary, or acquired, its more or less quiet diffusion, are accompanied by various accidents, the evolution of which depends upon the stock and the terrain. Bacillary rheumatism is a form of accident due to the virus, the mutation of which into the bacillus stage evolves very slowly without creating any obvious clinical signs; the specific lesions will appear later at the adult or egress period of the bacillus. We can therefore admit that in tuberculous rheumatism virus and bacillus are associated, creating in turns primitive "inflammatory" lesions, the evolution of which

reveals the origin and nature of the causal agent. Perhaps could we, by using more freely the very sensitive Löwenstein medium, disclose the presence of the Koch bacillus in the blood, and forecast, as they appear, the nature of those articular inflammations that follow more or less prolonged and virulent discharges of "agressive bacilli" (Sergent), which are not completely eliminated by the natural emunctories, we might settle this important question. The doctrine of Poncet and of his school, to which we have tried to give a revival, is thus in full accordance with the actual doctrine held by Sergent and its pupils. The "Master" from Lyons shed new light on the question, when it was still obscure. He was, like Trousseau and many other great clinicians in the world, struck with a spark of genius. Let me, in support of these opinions, report a personal and clinical observation, together with an experimental control, and three other cases recently published in Europe by Laignel-Lavastine.

CASE 1

A.F., aged 35, a house painter, was admitted to the hospital on July 21, 1932, complaining of pains in the legs, neck, jaws, for nine years.

Personal history. — Eruptive diseases in childhood; gonorrhœa at 20.

1923.—Debut was by vague pains along the spine, radiating more or less towards the thorax and the extremities. The movements of the head were slow and painful. About the same time inflammation developed at the tibio-tarsal articulation of the right foot. The movements were limited; ankylosis soon started, becoming complete.

1924.—The right foot remaining in the same state, the left one showed after a few months the same condition as the right.

1925.—The left temporo-maxillary articulation was swollen, and mastication was painful. The patient opened his mouth with difficulty, and movement became more and more difficult. Liquids alone could be taken. At about the same time a left orbital neuritis appeared. The condition was progressing in all the joints without retrogression.

1926.—The disease was progressing in the spine. The cervico-dorsal region was stiff, and the patient had to turn his whole body around, to right or left. At this point, pains in the lumbar region on both sides were complained of, together with a painful swelling, limiting the movements of flexion and extension. There was no retrogression whatever of the disease. It invaded gradually all the articulations, proceeding always in the same manner. A radiotherapeutic and electrotheraeputic regime relieved the pain slightly, but brought no real improvement.

1929.—No change in the general state; emaciation; the local state was stationary or aggravated.

1930.—A swelling appeared in the left knee, which increased in size; local pains. The circumference was increased; superficially, the tissues showed a collateral circulation with a patellar effusion, an important fact to note. Each new articular effusion was accompanied by a slight inflammation in the other joints.

1931.—Left orbital neuritis; corneal ulceration; amaurosis.

1932.—The right knee was attacked also and behaved like the left.

1933.—For a few months, signs of arthritis with ankylosis appeared, localized to both shoulders, chiefly the right. The hands were free.

Almost complete ankylosis of the tibio-tarsal and temporo-maxillary articulations; partial mobility of the right coxo-femoral joint. Relative immobilization of both knees; crackling sounds. In the right knee the patellar shock was felt. The ligaments were released, the interior groups of muscles of both thighs were atrophied. No adenitis.

Chest examination.—Amplitude diminished; a painful "zone of alarm". Rough and jerky inspiration; prolonged expiration.

Roentgenography (by A. Laquerrière).—Flattening of the articular interlines; extremities light and soft; alteration of the epiphyseal contours, with presence of osteophytes; decalcification of all the bony extremities.

The x-ray plate of the chest showed ganglionic spots, with dense peribronchial fibrosis and ossification of the costal cartilages; pulmonary fibrosis.

The *spine* showed signs of rhizmorphous spondylitis.

Right foot.—The general outline of the bony structure was normal, but there was total disappearance of the articular interline between the metatarsus and the tarsus, and between all the bones of the tarsus. The posterior part alone of the astragalo-calcaneus interline was distinguished. Sub-calcaneus exostosis; exostosis at the antero-superior part of the astragalus. Considerable diminution, almost disappearance, of the tibio-tarsal articulation.

The *left foot* showed the same appearance, but the articular interlines had not completely disappeared. Most of them are "guessed" at for most of their length.

Left knee.—Osseous rarefaction affecting the entire extremity of the tibia and femur; extensive flattening of the articular interline, which, on the external side, had almost entirely disappeared, the osseous surfaces being in contact. The edges of the articular disc were very light and irregular; very marked osseous rarefaction of the patella; bony ridges along the posterior side of the inferior extremities of the femoral diaphysis; marked opacity of the patellar tendon.

FIG. 1.—Tuberculous arthritis of the knees. Removal of fluid from the right knee for inoculation. (Case 1).

FIG. 2.—Cyst of the extensor tendon sheath, with riziform bodies; chronic deforming arthritis; contraction of the palmar aponeurosis. (Case 6).

In view of such an obstinate and extensive polyarthritis, we thought of *syphilis, gonorrhœa* and *tuberculosis*. Syphilis was excluded, since no scar was found. Gonorrhœa, possibly,

could have existed from the first days of this infection, because of his gonorrhœa at 20, but gonorrhœal rheumatism does not develop in that manner. The acute process quiets down progressively, to end by cure or ankylosis; its evolution stops there. A very careful physical examination by Professor Fournier enabled us to eliminate this etiology. We soon connected this progressive rheumatism with ankylosis with tuberculosis, on account of its aspect, its clinical signs and its evolution. If, from a clinical standpoint, it apparently assumes various forms, we must admit, considering what we have previously said, that we had to do with only one kind of chronic rheumatism, although observed at different periods of its evolution, with the anatomopathological characters which distinguished it. Whether we had to do with polyarthritis with deformity, polysynovitis, dry, plastic, exudative, fungous, or with "rice-bodies", coxalgia, progressive rheumatism with ankylosis, but one etiology was admissible—tuberculosis.

For several months we waited for the opportunity to identify in our patient the bacillus we were searching for. At last, during an acute attack in the right knee, we succeeded in withdrawing a quantity of articular fluid that we inoculated into a guinea-pig on December 2, 1932. The result (report of Dr. Albert Bertrand) reads as follows:—

Inoculation, December 2, 1932.—Autopsy March 7, 1933. Nodule of inoculation located on the epiderm of the abdomen, *with presence of Koch bacilli.* Inguinal adenitis, bilateral, *with presence of Koch bacilli;* adenitis of the mesenteric ganglia; splenomegaly, with miliary granulations; miliary granulations in the liver, *with the presence of Koch bacilli.*

Here we have the experimental proof of a tuberculous origin for this rheumatism, as we had affirmed it eight months before on the basis of the clinical aspect and the evolution. Since then we have collected three recent observations (April 18, 1933), the onset of the disease being traced back as follows: one case to 1916, another to 1919, and a third to 1930; a fourth concerned a patient who became completely ankylosed before he died in 1914, twenty-three years after the onset of his rheumatism.

Case 2

The first of these observations concerns a female, aged 61, with arthralgia of the feet, which could be traced back to 1916. There was a second attack in 1926 in the upper limbs, characterized by articular effusions that lasted five months. In 1929, the same process occurred in the left knee, repeated in 1930, when it forced her admission into hospital. No evidence of tuberculosis was found either in herself or in her neighbourhood.

After the x-ray and other examinations, and when a skin reaction was found positive to tuberculin, it was decided to puncture the knee-joint and inoculate the fluid intradermically into a guinea-pig. Inguinal adenitis developed, but the slide was negative. A blood culture, made according to Löwenstein's technique, gave colonies of virulent Koch bacilli after three weeks.

Case 3

The second relates to a female, aged 53, seen in 1931 for a subacute rheumatism. She had had pleurisy at 20; from 1916 to 1919, rheumatism of the left knee, developing into a tumor albus, and for which resection was done. In 1920, there was an acute attack in the right knee. From 1924 to 1931 all the articulations were affected with inflammation, more or less acute, followed by loss of flesh.

Blood culture was negative, but the tuberculin test (skin-reaction) was strongly positive, and was accompanied by arthralgia of the articulations most recently involved, with reactivation of a scarification practised two months before for a skin-reaction to tuberculin. The biological proof is reported later.

Case 4

The third observation relates to a female aged 67, with rheumatism which had progressed since 1930. The case was entirely similar to the two preceding ones.

According to these observations, as well as our own, we notice certain facts important from a clinical standpoint as regards more particularly tuberculous rheumatism; they are *the existence of local attacks, alternating with more or less brief periods of respite, and also the obstinacy of the local relapses.* The last observation is impressive from the point of view of evolution.

Case 5

This concerns a male, aged 38, in whom the first articular pains occurred in 1891, when 20 years old. Articular effusions developed successively, passing from one joint to another, and followed by stiffness or ankylosis. This rheumatism had an evolution of 22 years. In 1913, this patient, who died in 1914, was entirely rigid, to such an extent that he could be lifted from the ground by his head; to dress him the male nurse would hold him in his arms and put him on a table as if he were a piece of wood. He presented all the aspects of tuberculous rheumatism, from simple inflammation as far as cold suppuration, fungous lesions and fistulation, tumor albus, ankylosis and spondylitis. We lack the bacteriological proof here, but the history is complete enough.

We wish to add to this three other clinical forms of tuberculous rheumatism, which are too often not identified—*chronic arthritis; cyst with "rice-bodies"; retraction of the palmar aponeurosis.*

Case 6

This patient, a male, aged 43, who had complained for three years of a swelling localized to the back of the right hand, with signs of arthritis deformans of one of the joints of the medius, on the same side. This inflammation caused a very marked deformity as depicted in the figure. There is a cyst of the hand (see Fig. 2), with "rice-bodies", lying on the sheaths of the extensors, with arthritis deformans of the metacarpo-phalangeal joint of the digitus medius. This chronic rheumatic

lesion was accompanied by a double retraction of the palmar aponeurosis, complained of from childhood. Both these manifestations are usually tuberculous. These are typical cases of "inflammatory" tuberculosis, where the lesions lack all the "specific" characters. The right hand exemplified a double process, hydropic and fibrous, dependent on one etiological factor—tuberculosis.

CASE 7

Erythema nodosum.—In 1913, Professor Landouzy published a typical case of erythema, with arthralgias and probable endocarditis, occurring in a female aged 27, a servant, suspected of having tuberculosis. A biopsy of one of the nodules revealed the existence of acute inflammatory lesions of a *simple* type, without granuloma and with neither epithelioid cells nor giant cells. The bacteriological examination of a section taken from the neighbourhood of one of the vessels revealed in the lumen of one of them a typical Koch bacillus. The inoculation of a portion of this nodule into a guinea-pig, killed on the seventh day, produced the following result—*nodule at the point of inoculation, full of Koch bacilli;* tuberculous granulations in the spleen, liver, and lungs.

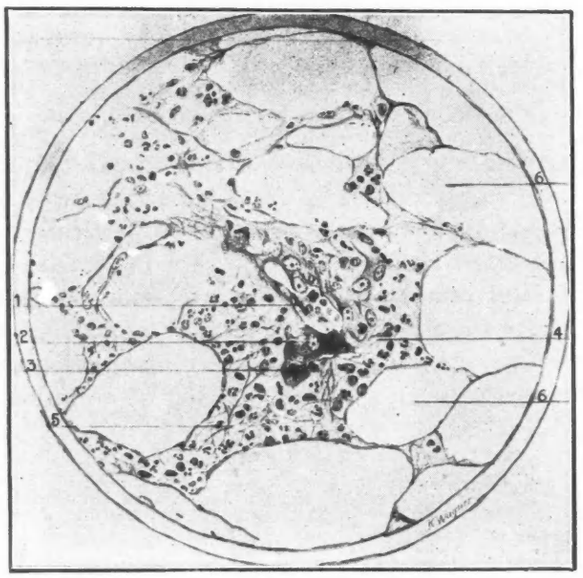

FIG. 3. (after Landouzy).—Section of a nodule of erythema nodosum. (1) Bacillus of Koch caught in a coagulum within the lumen of a vessel. (2) Endothelial cells of a vessel showing inflammatory reaction. (3) Endothelial cell of a vessel in karyokinesis. (4) Perivascular fibrino-cellular exudation. (5) Filaments of fibrin. (6) Fat vesicles in the subcutaneous tissue.

This result is entirely comparable to ours. We have observed a similar case in our ward at the Notre-Dame Hospital. Facts such as these should invite caution when we are studying the many rheumatic patients that pass before us; tuberculosis is too often forgotten about.

CONCLUSIONS

1. The existence of tuberculous rheumatism is proved by clinical facts, as, for example, where a simple inflammatory arthritis is often seen to precede fungous lesions and a characteristic tumor albus, thus revealing a tuberculous process. On the other hand, the "wavering" of the tuberculous lesions and rheumatic localizations is an indication of a common infection of metastatic type, the lung faring well when the articulations are painful, and conversely.

2. The laboratory demonstrates that injections of Koch's tuberculin may provoke synovitis, rheumatic pains, hydarthrosis, fungous arthritis, synovitis with "rice-bodies", or may wake up foci, apparently obsolescent, which continue to progress.

3. Pathological anatomy reveals in tuberculosis *specific* lesions and *simple inflammatory* lesions without anatomical specificity, but possessing bacteriological specificity, as proved by peritoneal inoculation of articular fluids; and common reactions of the tissues without anatomopathological or bacteriological specificity. Some sort of *para-tuberculosis* would be the condition which we call *inflammatory tuberculosis* accompanied by vascular reactions of the common congestive type and embryonic infiltration of the connective tissue.

4. The exact determination of all these lesions at different stages would be met by four hypotheses—the respective action of diffusible toxins and adhesive poisons, and the direct action of the bacillus and of the filterable virus. We prefer the latter.

5. The lesions of "inflammatory" tuberculosis (ante-bacillary period) are to be attributed to the filterable virus, whereas the specific lesions are produced by the Koch bacillus. "Inflammatory" tuberculosis is genuine tuberculosis, the progress of which is due to the activity of the Koch bacillus in certain modifications; tuberculous rheumatism is caused by a polymorphous infectious agent, the existence of which is, as a matter of fact, manifested under two forms—the filterable virus and the acid-fast bacillus. The mode of its evolution depends upon the seed and the soil. The many forms, as described in the text-books, are but different aspects in the evolution of the one disease, the unequivocal cause of which is the Koch bacillus, whether in the form of a filterable virus or in an adult state.

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NASAL INJURIES*

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WHEN a nose requires treatment because of injury thought should be given to its subsequent appearance and function. The treatment resolves itself into three lines. First, external lacerations should be pared and sutured to minimize scar production; secondly, the external bony framework is to be manipulated into proper position, to give the nose its normal contour; thirdly, any septal derangement should be corrected as far as possible, to minimize post-traumatic nasal obstruction and obviate later submucous resection of the septum. This last feature is doubly important in the infant and growing child, as a traumatically deformed septum in that period will result in improper development and formation of the adult nose. The problem is not entirely one of fracture of the external framework, because many a blow to the cartilaginous part of the nose can produce severe deformity of the septum which merits adjustment as much as does bony fracture.

SOME CLINICAL FEATURES

The injured member is brought to the physician or surgeon showing a variety of lacerations, contusions and displacements, depending largely on the amount of force producing the injury, the inflicting instrument, and the part of the organ which received the trauma. The salient points in the diagnostic problem and their significance are:—

1. *Swelling.*—This within half an hour adds difficulty to the diagnosis and sometimes renders it impossible by ordinary physical means. It is at its height in 12 to 24 hours and subsides progressively. This feature is well illustrated by two cases at hand.

CASE 1

A woman who had fallen downstairs was brought immediately to the hospital and seen by the house surgeon, who reported a slight laceration, bony crepitus, and a marked depression at the bony cartilaginous junction, as well as septal deformity. The case was not seen by the attending staff until the following day, when neither preternatural mobility nor crepitus were evident, and, there being no deformity visible, due to the swelling, a fracture was not diagnosed on the physical findings. Roentgenograms (Fig. 4c) showed the lower centimetre of the nasal bones to be fractured, depressed and impacted.

CASE 2

A football player received the impact of an opponent's head full on the nasal bridge. He was seen an hour and a half after the accident and, due to swelling, no external deformity was visible (Fig. 4d). Obviously, when the swelling subsided there would have been a marked V-shaped deformity and flattening of the nasal bridge.

2. *Lacerations* compounding a nasal fracture or injury may be internal, external, or through and through. Blunt instruments frequently produce ragged tears. External lacerations cause most concern, and should be probed to determine the presence of bony spicules or communication with the nose. Minimum scar production is important and with this end in view they should be treated early, the edges undermined, pared smooth, brought into apposition and sutured with horsehair, fine dermol, or a gossamer silk suture with needle attached, passing under the trade name "plastasute". No obstacle is offered to the treatment and splinting of the fracture, as the sutured wound can be protected with gauze from any splint that is to be used (Fig. 6a).

3. *Cartilaginous injuries* are not uncommon, especially in children, and here the septum is the great sufferer. The bullous part of the nose receives the trauma, but, being a tough, cartilaginous arch, immediately resumes its shape without external deformity. Unfortunately, the force of the blow is transmitted to the cartilaginous part of the septum which becomes

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buckled or dislocated. Such an injury has greater significance in childhood, for the growing septum provides the force and prop which raises the flattened nasal bridge of the infant, or as Carter[1] aptly puts it, it is "the chief factor in giving prominence to the adult organ. . ." Nasal obstruction, too, results, so often followed by the aftermath of nasal underdevelopment and sinus trouble. This type of deformity, especially in the adult, can frequently be helped or offset by immediate manipulation and even intranasal splinting of the type described below.

4. *Fractures without displacement.*—A force of moderate severity strikes the lower border of the nasal bones and produces fracture, but because of the mechanics of the nasal arch, low articulation of the vertical plate of the ethmoid (Fig. 1a), the periosteum and tense nasal tissues, the fragments are held in a normal practical alignment. Aside from lacerations, this type of fracture requires no treatment.

5. *Depressed fractures of the free end of the nasal bones* result from severe head-on blows, the point of impact being close to the lower end of the nasal bones. They are more common in that type of nose in which the perpendicular plate of the ethmoid articulates high rather than low along the under surface of the nasal bones (Fig. 1). By the force of the blow the suspended tips are comminuted, driven inwards, and may be impacted behind the unfractured parts of the nasal arch. This type of injury is markedly deforming, frequently associated with severe septal derangement, and not uncommonly fragments of the nasal bones protrude through external or internal lacerations. Its treatment is often difficult and calls for immediate reduction, and it does well with both internal and external splinting.

6. *Lateral fracture with impaction.*—This, with the last type, provides the majority of nasal injuries requiring vigorous and immediate treatment. The traumatizing force is delivered to either one or the other side of the nasal bridge, and, as a rule, two fragments result. There are three fracture lines, one on each side through the frontal process of the maxilla toward the naso-buccal fold, and the third towards the vertex of the bridge to either side of the septal attachment (Fig. 2a). The fragments are driven in a hinge-like movement. That on the side of the impact is driven inwards and impacted under the opposite fragment which is rotated outwards. The resulting deformity is a lateral deviation of the nasal bridge, the concavity being on the side of the trauma (Fig. 5a). This type of fracture has been graphically described by Watson-Williams[2] in an excellent article and in a somewhat similar manner by Gillies and Kilner.[3] The condition can usually be diagnosed by appearance and manipulation. Treatment should be immediate, and consists of disimpaction and reduction under general anæsthesia. The convex overriding fragment is grasped by a heavy duckbill forceps, one blade internally and the other externally, and levered outward in a hinge-like motion (Fig. 2b). The other fragment is levered in the opposite direction, thus freeing the impaction. Then the two fragments can be moulded into their proper position by digital manipulation (Fig. 2c). Attention should be paid to the septum which is probably badly deviated. Opinions differ as to the advisability of splinting this type of fracture. Watson-Williams, and Gillies and Kilner think it unnecessary. An intranasal splint of the expanding wire type described below is often of great help in maintaining the septum in position. If properly manipulated, the external deformity does not tend to recur. An external splint of the plaster or compound variety will prevent post-operative hæmatoma and excessive ecchymosis, and assure against further traumatization.

7. *Nasal injuries occurring with more severe head injuries.*—Severe crushing blows delivered to the face provide a variety of injuries, which include fracture of the skull, orbit, superior maxilla and jaws. Fracture through the cribriform area is not uncommon.

CASE 3

An example is a case at hand resulting from an automobile accident where there was a fracture through the cribriform plate, orbit and maxillæ as well as a depressed comminuted fracture of the frontal bone both into the frontal sinus and anterior cranial fossa. The whole nasal structure, including some of the cribriform plate, hung loose, suspended by soft tissue alone.

Obviously here the more severe cranial condition has first claim, and any active nasal reduction and splinting is contraindicated. Nasal fractures in which the maxillary antrum is involved may be reduced and immobilized at the time the maxillary condition is dealt with. Occasionally, a nasal fracture is present together with a complete fracture of the upper jaw. The jaws should be wired into occlusion

or splints applied before correction of the nasal deformity is attempted.

ROENTGEN RAYS AS AN AID TO DIAGNOSIS

Roentgen rays, providing a simple, inexpensive and conclusive aid to diagnosis, should be a routine measure in all cases of nasal injury. The most satisfactory films are made by a method described by Flecker,[4] using dental films and a soft x-ray tube. Right and left exposures are taken, the film placed against the lateral side of the nose as deeply and high in the orbit as possible, limited only above by the supraorbital ridge. The tube is placed on the opposite side of the head and the rays directed through the opposite orbit and perpendicular, or as nearly so as possible, to the film. Detail is excellent, both of the nasal bridge and the lateral bony constituents. Besides the fracture lines, the maxillo-nasal sutures and even the lower border of the perpendicular plate of the ethmoid can be made out (Fig. 4).

REDUCTION

Treatment will vary with the individual case and facilities at hand, but the patient with average fracture derangement should be hospitalized for reduction and splinting, and then after two days may be discharged at the discretion of the operator for outdoor follow-up and removal of the splint. The best results are to be obtained under general anæsthesia, preferably an intratracheal type. The vigorous manipulation often necessary for reduction and intranasal splinting so frequently oversteps the bounds of the usual nasal local anæsthesias that the surgeon is handicapped and will often fall short of a perfect result. Many instruments have been devised for the reduction of nasal fractures, but the majority of them are unnecessary. A pair of wide rubber-covered duckbill forceps is indispensable in many stubborn cases, and with these in a nose with ample room both fragments and septum can be well manipulated. Sallinger[5] has devised a practical instrument for raising depressed fragments. However, in the experience of the Montreal General Hospital clinic the most frequently used and practical instrument has been a medium-sized hæmostat the point of which has been wrapped in a wisp of absorbent cotton.

The optimum time for reduction is on the first day of injury; reduction becomes proportionately more difficult as time passes. Swelling is no deterrent to reduction.

SPLINTS

The literature of the past twenty years contains a hodge-podge of description of intranasal and extranasal splints of varying complexity and applicability. This paper will endeavour to explain only three splints, two extranasal and

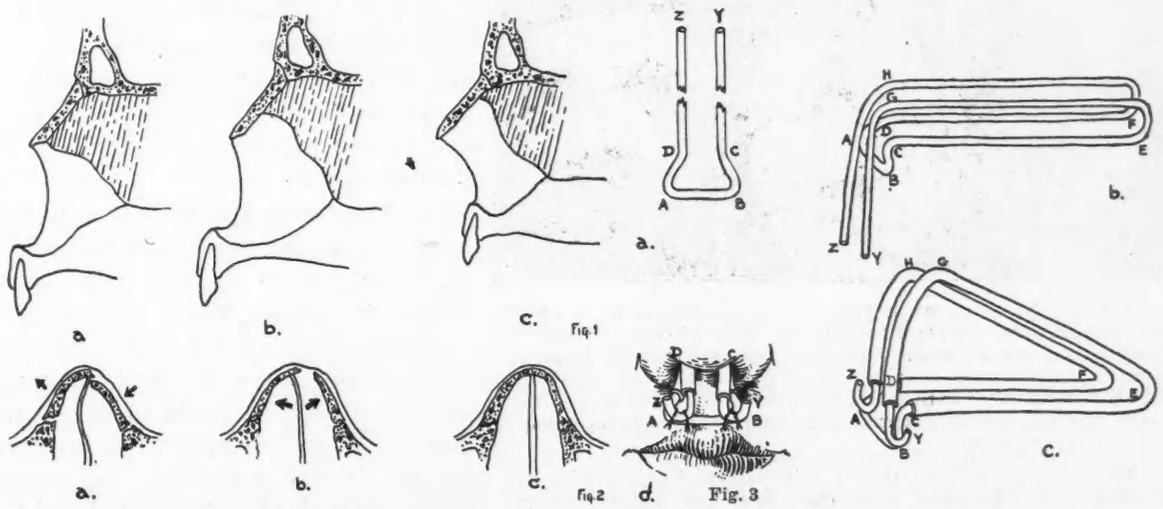

FIG. 1.—Showing the articulation of the perpendicular lamina of the ethmoid with the nasal bones (a) in the lower third, (b) in the middle third, and (c) in the upper third. The last type is particularly subject to depressed fractures.

FIG. 2.—(a) The mechanism of a lateral fracture with impaction; (b) its manipulation, and (c) the final corrected position.

FIG. 3.—A modification of Watson-Williams' intranasal expanding wire splint. (See Text). (a) The first four bends; (b) the splint ready for rubber sheathing and insertion; (c) the completed splint in its expanded position; (d) front view of the splint wired in position.

one intranasal, which have been found simple, inexpensive, and applicable to most nasal injuries.

1. *Watson-Williams expanding wire splint.*—This splint is simple, inexpensive, and theoretically and practically sound. It possesses all the advantages of the more complex, expensive and cumbersome splints, such as those of Martin or Mollinie, as described by Sargnon,[6] Salinger,[7] Carter or Watkin's modification of Carter's splint,[8] as well as the many other splints deriving anchorage from the upper teeth and forehead. Risdon[9] has devised a useful splint of the latter type which is unfortunately expensive and applicable only by the ultra-specialist. Watson-Williams' splint is applicable to most nasal injuries, especially the depressed type, and is very helpful in maintaining correction of the recently deranged septum. The original splint has been clearly described[2] by its author. A slightly modified form as described below is used in the nose and throat clinic of the Montreal General Hospital.

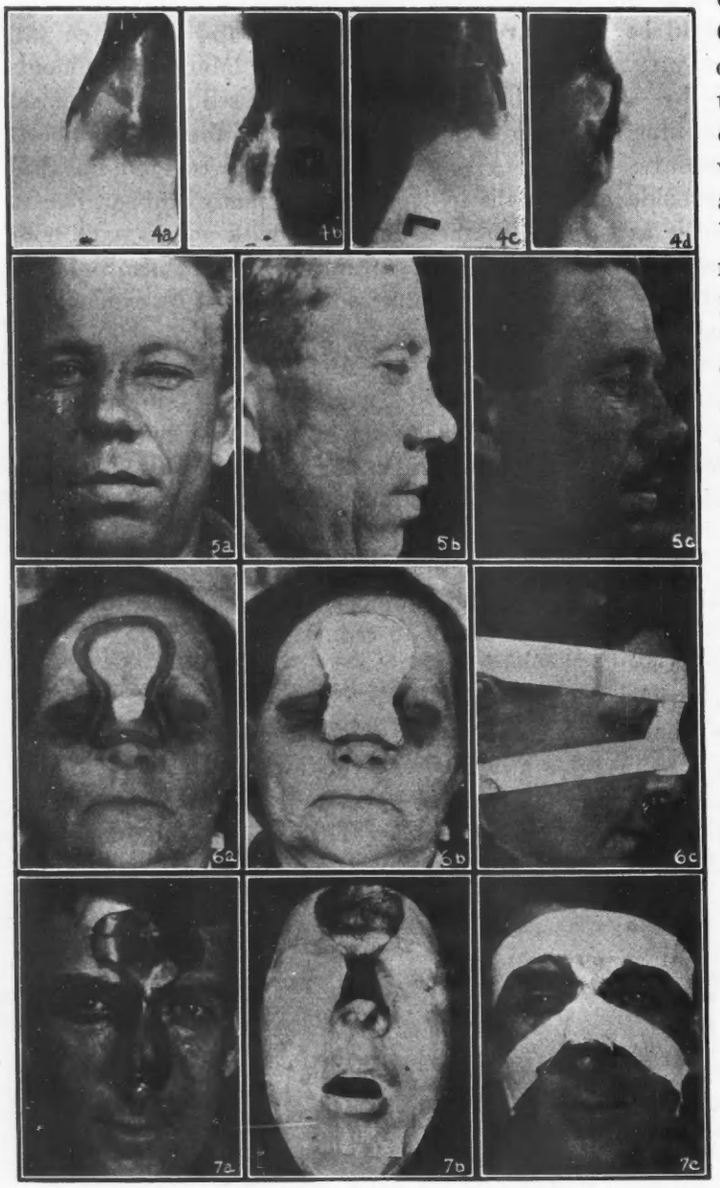

FIG. 4.—Nasal roentgenograms. (a) Normal nose in which the maxillo-nasal suture line and the perpendicular lamina of the ethmoid can be made out. (b) Fracture without displacement. (c) Fracture of tip with displacement and impaction. (d) Severe fracture with marked displacement. Due to swelling, there was no obvious external deformity. The septum showed marked derangement.

FIG. 5.—(a) and (b) show a mild lateral fracture with impaction. (c) The same seven days later just before removal of the intranasal expanding wire splint.

FIG. 6.—Construction of plaster of Paris external splint. (a) Plasticine gutter and dressing for external laceration. (b) Plaster poured in position. (c) Fixation of the splint. An intranasal wire splint is also in position.

FIG. 7.—Showing the construction of a metal-backed impression compound splint. (a) The compound pattern; (b) the metal backing on a plaster mask of the face; and (c) the complete splint.

The splint can be easily constructed from about 18 inches of a 15 or 16 gauge silver wire, which is purchasable at most jewelry houses at a cost of 80 cents. The middle inch of the wire is marked out, and bends made at A and B (Fig. 3). At C and D the long arms are bent parallel to each other at a distance apart to provide comfortable room for the columella and septum. The points C and D are grasped simultaneously in a pair of long-bladed forceps, and the long bars DZ and CY are bent at right angles to the plane of the part ABCD. At points E and F, two inches from C and D, the long arms are bent back on themselves. At G and H, FG and EH being also approximately two inches, large curves are made, the convexities of which are to fit under the nasal bridge. Before the final bends are made, a number 10 or 12 soft rubber catheter is cut in half and part carried over the intranasal part of each arm of the splint. When the splint has been expanded in the nose and the proper height determined, it is removed and the ends Z and Y are curved parallel to the curves at A and B to facilitate wiring and prevent slipping. It is wired with fine gauge malleable copper wire ligatures, two on each side. When the splint is in position in the nose, the part

ABCD rests against the upper lip and philtrum (Fig. 3d) preventing backward slipping into the nose. DE and CF rest along the floors of the inferior meatuses, providing counterpressure. G and H come to rest under the depressed nasal fragments giving elevation and support. The appliance is comfortable, well tolerated, and may be kept in place 7 to 8 days, when it is best removed under short nitrous oxide and oxygen anæsthesia.

2. *External plaster of Paris splint.*—This type is lighter, more comfortable, and accommodates a better dressing for external lacerations than do the compound and metal varieties of external splints. With a thin strip of plasticine, a butterfly pattern is mapped out on the patient's nose and forehead (Fig. 6). A creamy mix of any impression plaster (Snow White No. 1, Bremner's, etc., purchasable at dental supply houses) is made and poured into the plasticine gutter to a depth of a quarter of an inch or less, and smoothed off as it sets. When hard (1 to 3 minutes) the plasticine and splint are removed, and the former separated from the latter. The splint may be trimmed and smoothed to the desired thickness. If there are any lacerations a tiny gauze dressing may have been placed before pouring the plaster over it. The splint is fastened with two one-inch wide adhesive strips passing around the head, the lint being left on the adhesive for the hair-bearing areas. This splint possesses an added advantage in that the plaster contracts slightly on setting, making the splint very comfortable and snug.

3. *External dental impression compound splint.*—This splint is heavier and more cumbersome than the last variety, and tends to bend slightly at body heat. One to one and a half wafers of Kerr's or S.S. White's dental impression compounds are immersed in almost boiling water until they become soft and plastic. They are worked with the moist bare fingers into a ball to exclude wrinkles, then fashioned into a butterfly pattern and fitted to the nose and forehead (Fig. 7). This may be reinforced with an 18 to 20 gauge Britannia metal or lead backing cut to the same pattern but slightly smaller, heated gently, and sunk into the compound. The whole is chilled with gauze soaked in ice-water. When cold and hard (in a few seconds) it may be removed, and the edges trimmed as desired with a sharp knife or scalpel. It is secured in the same manner as the previous splint.

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THE ETIOLOGY AND MEDICAL TREATMENT OF DISEASES OF THE EXTRA-HEPATIC BILIARY TRACT

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MANY new facts have been added to our knowledge of the anatomy and physiology of the biliary tract. The liver is continuously secreting bile, though at a varying rate, most of which passes into the gall-bladder, as the sphincter of Oddi at the lower end of the common duct is usually closed during the fasting state, preventing the steady flow of bile into the duodenum. In the gall-bladder, the bile is concentrated 8 to 10 times, or even more, by absorption of water and soluble salts through its wall, and this highly concentrated bile under the stimulus of food, especially fatty food, in the duodenum is evacuated into the small bowel under active contraction of the gall-bladder muscle with associated relaxation of the sphincter of Oddi.

Westphal[1] has shown that the sphincter of Oddi consists of two parts, an upper or duodenal portion, chiefly of oblique muscle, and a lower portion of much thinner, somewhat isolated, circular muscle at the papilla of Vater. Westphal found experimentally that mild vagus stimulation excited orderly contraction of the gall-bladder, peristalsis of the duodenal portion, and relaxation of the papillary portion of the sphincter of Oddi with resulting flow of bile; stronger vagus stimulation caused a spasm of the duodenal portion of the sphincter, against which the gall-bladder might contract in vain.

Again, stimulation of the sympathetic caused relaxation of the gall-bladder and of the common duct with contraction of the weak muscle at the papilla of Vater.

In addition to nervous control, Ivy[2] seems to have proved a hormone influence in gall-bladder contraction and evacuation, though this requires further confirmation. The hormone is like secretin chemically, and is produced chiefly by the upper intestinal mucosa upon contact with dilute hydrochloric acid and very probably certain fatty substances. The intravenous injection of the hormone, tentatively called cholecystokinin, causes gall-bladder evacuation in animals, including man.

In the development of our knowledge of the biliary tract, gall-stones naturally first attracted the attention of physicians. Naunyn explained their origin by a stone-forming catarrh of the mucous membrane of the gall-bladder. This catarrh, he held, was due to stagnation of bile combined with consequent infection of the biliary passages with bacillus coli ascending from the intestines. Aschoff and Bacmeister later showed that pure cholesterin calculi can form in the gall-bladder without inflammation, from a disturbance of cholesterol metabolism. It is known that cholesterol is secreted in the bile, being held in solution by the bile salts. Cholesterol is for the most part synthesized in the body, but the cholesterol content of the blood can be raised by diet only if a high fat diet be given over a long period. Even so, there is no necessary association between the level of the blood cholesterol and the bile cholesterol; the blood cholesterol is usually raised just before child-birth in pregnant women, as McEachern and Gilmour[3] have recently confirmed (with reservations), while the bile cholesterol remains low. *Post partum*, there is a marked rise of bile cholesterol.

While cholesterol is held in solution by the bile salts in a healthy gall-bladder with little absorption occurring, Rosenthal and Licht[4] found that in dogs an *inflamed* gall-bladder wall absorbs the bile salts alone, leaving the cholesterol, which then precipitates in absence of its solvent. Confirming this observation, Newman[5] found the proportion of bile salts in relation to cholesterol present in the bile of gall-bladders containing faceted (inflammatory) stones was very much reduced, thus explaining the source of the cholesterol which forms over 90 per cent of faceted stones. In "strawberry gall-bladder," Boyd, Walton, Williams and McLachlan all stress the almost constant presence of a mild degree of chronic inflammation. Hence there results, as Newman points out, first infection, then absorption of bile salts, next, precipitation of cholesterol and fatty acids to form a lipoid mixture, and, lastly, absorption of the lipoid by the mucosa, giving rise to the strawberry appearance of the interior of the gall-bladder.

The centre of interest thus passes from gall-stones to chronic inflammation of the gall-bladder. But it is still highly debatable how the gall-bladder becomes infected. Rosenow has long held that the gall-bladder is infected through the blood stream. He isolated non-hæmolytic streptococci of low virulence from the wall of the gall-bladder in cases of chronic cholecystitis and reproduced the disease experimentally in animals by injecting the culture into the blood stream. A few investigators in the United States have confirmed this finding of an elective affinity of the streptococcus for the gall-bladder wall. A. L. Wilkie,[6] in 1928, found that bile inhibits the growth of organisms and that positive cultures of non-hæmolytic streptococci could be obtained in 86 per cent of cases of chronic cholecystitis from the cystic gland and in 42 per cent from the outer coats of the gall-bladder uncontaminated by bile. This would seem to be very strong proof of infection by the blood stream. Unfortunately, in 1930, Williams and McLachlan[7] from the same laboratory, working on a much larger material, failed entirely to confirm Wilkie's results. In 106 cases of cholecystitis, they found streptococci in the cystic gland or gall-bladder wall in 16 per cent and bacillus coli in 19 per cent, while from the bile streptococci were isolated in 26 per cent and bacillus coli in 20 per cent of cases; the organisms isolated had very little power of localizing electively in the gall-bladder wall of experimental animals and the streptococci found were largely of the type occurring normally in the bowel.

Graham,[8] supported by Moynihan, finds that some degree of hepatitis is an almost constant accompaniment of cholecystitis, and he suggests that chronic infective processes in the area drained by the portal system may lead to a hepatitis which by direct spread through the lymphatics will secondarily involve the gall-bladder. He points out, as supporting his view,

that in many cases of cholecystitis the outer coats of the gall-bladder show marked inflammatory change, while the mucous membrane is comparatively intact. He emphasizes, however, that, once a cholecystitis is thus set up secondary to hepatitis, the inflammation of the gall-bladder in turn by lymphatic spread may lead to further hepatitis; by functional tests of the liver, there is usually some impaired hepatic function in cases of cholecystitis, a finding confirmed by Cantarow.[9] Hence Graham concludes that in many cases, perhaps in a majority, cholecystitis represents a direct extension to the wall of the gall-bladder from a liver already inflamed.

It has long been known that in typhoid fever and in many other general infections the corresponding organisms can be recovered from the bile in the absence of any inflammation, for which stasis of bile or the presence of calculi seems to be necessary as secondary factors. Ascending infection by the *B. coli* from the duodenum has been in recent years generally denied or admitted to occur only exceptionally. Hurst,[10] however, within the last year again claims that bacillus coli cholecystitis is as common as bacillus coli pyelitis and cystitis. He brings evidence, chiefly from duodenal drainage, to show that in gastric anacidity, which is found in 22 per cent or more of patients suffering from gall-stones, ascending infection of the biliary tract, including the gall-bladder, occurs quite frequently, that acute or subacute gastritis accompanied by *temporary* gastric anacidity will allow the *B. coli* to ascend to the duodenum and stomach, whence an ascending infection of the bile ducts may readily occur.

A new note is struck by Westphal, aided by Gleichmann, Mann[1] and other German investigators, who have for many years been working on the problem. Westphal was impressed by the absence of any indication of inflammation, either in the clinical history, the operative findings, or the microscopic post-mortem examination of many calculi-containing gall-bladders. Hence, relying on his experimental work already described, on the nervous supply of the biliary system, he concluded that we must look on the whole extra-hepatic biliary tract as a physiological unity whose neuro-muscular mechanism is liable to be disturbed reflexly. In particular, he stressed the effect of strong vagus stimulation in causing spasm of the duodenal portion of the sphincter of Oddi with associated unavailing spasm of the gall-bladder. Thus he found in specimens obtained at operation or post-mortem, where no calculi or inflammatory change complicated the picture, a *hypertonic* stasis gall-bladder with thickened muscular wall, a dilated common duct, and hypertrophy of the upper portion of the sphincter of Oddi. Similarly, confirming the effect of sympathetic stimulation, he found a *hypotonic* stasis gall-bladder with distended weak muscular wall, undilated common duct, and a poorly developed sphincter. Westphal claimed further, though less convincingly, that by stasis induced from disturbance of the neuro-muscular mechanism and aided by the concentrating power of the gall-bladder, he could produce experimentally fine deposits of bilirubin-calcium, which might sometimes form the nucleus of calculi developing in the absence of all bacterial infection or inflammation. Such non-inflammatory origin of biliary calculi is vigorously rebutted by Newman.

In any case, even according to Westphal, infection and inflammation are present in most cases of biliary tract disease, and of course, gall-stones are a very frequent accompaniment; he stresses only the importance of disturbances in the neuro-muscular mechanism; *such disturbance of function may precede any organic change and may give rise to colic in itself,* while in the presence of latent gall-stones or latent cholecystitis, the same functional disturbance may suddenly precipitate symptoms. Newman accepts Westphal's views on the frequent reflex disturbance of the neuro-muscular mechanism of the biliary system and describes in detail the clinical picture ensuing.

TREATMENT

The prophylaxis and treatment of diseases of the extra-hepatic biliary tract is necessarily tentative, as our knowledge of their etiology is incomplete. Gall-stones and gall-bladder inflammation are often found accidentally at operations and are found post-mortem in about 30 per cent of all bodies over the age of 40, if we combine the recent estimates of Graham, Von Bergmann[11] and Hurst; very many patients obviously suffering from biliary tract disease have slight symptoms or comparatively infrequent attacks of colic, which often entirely disappear. Even acute attacks of cholecystitis involve only exceptionally immediate risk to life, in marked contrast to appendicitis, so that but

few surgeons advise immediate operation in acute cholecystitis, and many, for example, Graham, of St. Louis, warn expressly against this course, because of the unnecessary risk to the patient. It is thus obvious that the treatment in the great majority of cases of biliary tract disease is now, and should be, medical. Better appreciation of the early manifestations of biliary tract disease is urgently needed; so armed, the general practitioner can do much more than give an occasional injection of morphine, as is at present too often the extent of medical treatment.

The scope of prophylaxis is naturally limited. Stout women towards middle age may often with advantage have their mode of life regulated. Foods rich in cholesterol—yolk of egg, cream, butter, bacon, pork, sausages, rich stews, fried fish, goose, duck, lobster, sweetbreads, liver, kidneys, peas and beans, should be limited, both in the hope of keeping the blood cholesterol from rising unduly and, especially, to limit increase in weight. After childbirth, the blood cholesterol and the bile cholesterol usually rise and I think, nursing women are encouraged unnecessarily to stuff on rich food in order "to have plenty of milk" for the baby. Sufficient fluids should be insisted on, as the amount of bile is definitely influenced by the fluid intake; a tumbler and a half of hot water an hour before breakfast and at night may well be advised and if there be any tendency to constipation, concentrated solution of sodium phosphate, a teaspoonful or more with the hot water in the morning, is very useful, or if it be feared that this may affect the supply of milk, cascara or other mild aperient may be substituted. Food at comparatively short intervals is the best means of emptying the gall-bladder; it is noteworthy that at Carlsbad, butter seems to be rarely forbidden. Large meals, eaten in haste, should be avoided. Exercise, especially in the open air, walking, golf, swimming, etc., are valuable in keeping the general health up to the standard; setting-up exercises, dancing, so readily available now in the home with phonograph and radio, may be mentioned. Stooping over a table while sewing or reading should be avoided, a very necessary warning as I have found. Foci of infection, especially in the mouth, should be removed. Dentures may be necessary.

I believe personally, that very many of the attacks of sudden colic depend on *disturbance of the neuro-muscular mechanism.* Reflexly, from too large meals, perhaps eaten hastily, from indigestible foods with coarse vegetables and fats of high melting point, a sudden spasm of the sphincter of Oddi occurs with associated contraction of the gall-bladder and sudden rise of pressure in the whole biliary tract. In such a colic, there is no temperature; vomiting, either spontaneous or induced, ends an attack at once if the stomach be completely emptied; there is no soreness afterwards and within a short time the hepatic area is not even tender on pressure. I cannot conceive of an inflammatory condition rising and disappearing in an hour or so in so dramatic a fashion; some of these cases operated on in Germany have had no gall-stones or microscopic evidence of inflammation in the excised gall-bladder. The same disturbance of function still more frequently complicates the picture where gall-stones or chronic inflammatory changes are already present, and seemingly, even here, the pathological physiology of the biliary tract may dominate in importance the gross organic pathology. It is probable too, that at the menstrual periods and in pregnancy upsets of the orderly flow of bile may occur; mental or physical stress is often a factor.

The treatment of this phase is extremely satisfactory. General supervision of the patient's life, of his work and play, of his philosophy of life, and especially of his emotional reactions, when this is possible, combined it may be with 2½ grains of adalin or ¼ grain of luminal after meals and at night—these general measures are often of great value. The diet should be smooth, avoiding, generally, condiments, radishes, mushrooms, pickles, corn, cabbage, raw onions, cucumber, new and whole wheat bread, hot buttered toast, nuts and raisins, cheese, pork, salmon, veal, duck, lobster, raw apples, candies and strong coffee. One or two tablespoonfuls of olive oil at night lead to a freer flow of bile over night and 1/150th of a grain of atropine three times a day is sometimes useful, or Tr. belladonnæ, m.10 (or more) t.d.s., as advocated by Newman.[12] Should, as often occurs, an attack follow too large or too indigestible a meal, early and complete emptying of the stomach usually ends the attack—a procedure I would urge in preference to sedatives. Of course, hot fomentations, the hot-water bag, and large linseed poultices are most valuable for relieving

pain; atropine 1/100th of a grain hypodermically allays the underlying spasm and is specially serviceable after the stomach is empty, should, exceptionally, the pain persist; morphia, it should be noted, leads to spasm of the sphincter of Oddi, and should therefore be avoided if possible. The general practitioner sees this type of attack from neuro-muscular derangement far more often than the hospital surgeon, as it is less severe as a rule and shorter in duration than that associated with acute cholecystitis or movement of calculi. It must however be remembered that such attacks, at least when frequent, are usually associated with chronic cholecystitis or gall-stones, though these latter factors may play no part in the production of the colicky seizure. I suggest that this neglected neuro-muscular disturbance may partly explain why Judd[13] finds his operative results in younger patients not so good as in his older subjects, and why a few attacks of colic frequently follow soon after an ultimately satisfactory operation.

Under prophylaxis, most of the measures at our disposal to prevent *stagnation of bile* are already described. Epsom salts in doses sufficient to produce satisfactory evacuation without purging, may be given in concentrated solution in the early morning; if the patient lies on his right side with the pelvis high, the hot solution passes apparently more readily into the duodenum and may replace duodenal drainage. Bile salts are the best cholagogue; it seems that decholin (sodium dehydrocholate), which is used extensively in Germany and has recently been investigated by Sterner, Bartle and Lyon,[14] is a non-toxic bile salt which can be given intravenously and is much the best bile salt preparation to increase the flow of bile. This drug will probably come into more general use.

In *acute cholecystitis* rest in bed should be insisted on, even after all pain has disappeared, while any tenderness along the liver edge persists; attacks often recur at short intervals, apparently owing to insufficient rest and carelessness in the diet. In the acute attack morphia with atropine may be necessary and can be given freely; the few cases of phlegmonous, gangrenous or suppurative cholecystitis should, of course, been seen and controlled by a surgeon. Large linseed poultices are very valuable in relieving pain and in getting rid of inflammation; they are, in my experience, much more useful than the hot water bag and are not employed nearly as often or as systematically as they should be. They should be applied hot enough to give rise to broad, brown pigmentation later. Hurst urges the use of hexamine, which he points out may be given without irritant action on the bladder if the urine be kept alkaline; he now gives 100 grains of hexamine with 60 to 100 grains each of sodium bicarbonate and sodium citrate after breakfast, after tea, and at night, with a glass of water; the drug is excreted into the bile and may rapidly clear a previous bacillus coli infection.

There is no doubt in my mind that when a number of attacks of cholecystitis have occurred within a comparatively short time, latency of symptoms may often be induced by three weeks in bed, light diet, large linseed poultices twice in the morning and twice in the afternoon, with 1½ tumblerfuls of hot water an hour before meals and at night, combined with the use of sodium phosphate or Epsom salts as already described. Avoidance of chilling is important. Should the attacks recur in spite of such rest and treatment, operation should be urged, but the scope of my paper prevents my dealing further with the indications for surgery.

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CANCER RESEARCH*

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II

IN the whole field of experimental medicine there seems to be no problem equal in magnitude to that of malignant disease. We are faced by the cancer cell, a foe so small that it cannot be seen except under the microscope, so tireless that it proliferates ceaselessly and indefinitely, and, if we include transplantable tumours, would seem to be almost immortal. Cancer is a relentless foe, giving no quarter, and so despicable that it wears no distinguishing insignia until it has obtained a foothold, and is then so deadly in its effects that no uniform is needed to recognize it.

The real magnitude of the problem from the standpoint of investigation lies in the complexity of the several facts which have already been brought to light and which a complete solution should reconcile. Because of this complexity, cancer research is by far the greatest subject with which experimental pathology is concerned. Its literature is so enormous that periodical publications of abstracts are devoted to its consideration.

Analysing the progress of the last thirty years, certain important advances are noted. The first great achievement, accomplished early in this century, was the successful transplantation of malignant tissue. This was an outstanding contribution. An adequate supply of tumour material in animals was thus made available on demand. Conditions of transmission were studied in the hope of finding the nature of the genesis of the disease; methods of protection against inoculation were found and the resistance of the cancer cell to various agents studied. However, while these contributions helped to unfold some problems they only partially answered the question. A tumour transplant is an artificial metastasis in a normal animal. The results obtained on transplantable tumours must be paralleled in spontaneous tumours before being admitted to have much value.

Further advancement is manifest, pursuant to the extended research and experimentation of Johannes Fibiger, a Danish pathologist. This is one of the most extraordinary stories in the whole of pathology. While examining rats in a study of tubercle bacilli, Fibiger found three with cancer of the stomach. These cancers contained a parasite, now named the *Spiroptera neoplastica*, which he was able to trace to an uncommon type of cockroach which had come in sugar from the West Indies. When the cockroaches were eaten by the rats infesting the particular sugar factory concerned, the larvæ coiled up in the muscles of the cockroaches developed into the adult nematodes in the stomach of the rats. By feeding rats in this way, Fibiger was able to induce cancer in them, though he was not successful with other animals. That is, in a particular animal, infestation by a particular worm led regularly to a series of changes culminating in malignant disease. The story of Fibiger's discovery, with its succession of trial and error and final dramatic success, stands as a model of research, and reads like a romance. Carter and Bullock, in the Crocker laboratory in New York, have since found a parallel in the production of experimental sarcoma in the liver of rats resulting from infection from *Cysticercus fasciolaris*, the cystic stage of *Tænia crassicollis*, a tape-worm of the cat.

Finally came the discovery by Yamagiwa and Itchikawa of the cancer-producing action of tar. By applying tar every three days to the inner surface of the ears of rabbits and continuing this application for periods of from 55 to 360 days, in a few of the animals used carcinoma appeared at the site of application. For the first time, malignant disease was experimentally produced by a chemical irritant.

These episodes constitute three great land-

* Read at a District Meeting, Ontario Medical Association, Chatham, Ont., October 5, 1932.

marks in the enormous mass of experimental contribution. In addition, however, a surprisingly large amount of accurate information has been gathered in the last thirty years,—some valuable because it is positive, and some, while negative, valuable because it permits the rejection of earlier hypotheses and to this extent helps to clear the field for future investigation. Thus cancer has been found to occur rather frequently in fishes, so that it seems clearly unnecessary to give further attention to soil and climate as possible causes. Accordingly, as the disease affects all forms of animal life, at least down to the reptile, no more time need be wasted in examining habits and customs peculiar to man in search of the cause, except in so far as these have to do with chronic irritation.

Thirty years ago, it seemed that we would have to explain why sarcoma was common in youth and carcinoma in advanced life; in other words, why the same process should attack connective tissues when they are young and epithelium when it is old. To-day it is known that sarcoma, like carcinoma, becomes more frequent, the greater the burden of the years, and it is strongly suspected that age itself may really have nothing to do with the inception of malignant disease, save only that long life means an extended period throughout which the action of an irritant can be exerted. This suspicion is but one of the fruits of experimental production of malignant disease in animals. Another is the discovery that factors are involved other than the carcinogenic agent employed. The incidence of cancer does not rise with increasingly intense irritation. Unusually violent irritants do not seem to produce cancer at all. Instead of looking for one cause of cancer, therefore, we are beginning to realize that there may be many causes. If these various causes happen in certain sequence and combination then cancer may result.

After listening to the clinical data presented at this meeting one might well feel pessimistic. And yet, only ten years ago, diabetes looked very hopeless. Right in this province insulin was discovered and applied. Ten years ago pernicious anæmia was considered a fatal disease and liver therapy was not thought of. The present day results speak for themselves.

It is true that the morphological study of cancer so eagerly begun during the past century, and so often derided during the present one, produced no cure and uncovered no etiological agent. But are we quite fair to these earlier workers when we overlook the fact that they laid the foundation upon which the pathologist now relies in making his diagnosis and the surgeon in planning the scope and extent of his operation? The further investigation of the fundamental factors involved, including the biological behaviour of tumours, is going on now all over the world. One may hope that, surely, all our labouring will not be in vain.

PAINFUL BACK.—A. S. B. Bankart (*Post-Graduate Med. J.*, May, 1933, p. 166) simplifies the causes of pain in the lower part of the back by classifying them as neurotic spinal, sacro-iliac strain, lumbo-sacral strain, acute and chronic (lumbar) back strain, and spinal arthritis (osteoarthritis) with or without sciatica, as well as the more definite clinical entities such as true lumbago, Pott's disease, and compression fractures of the lumbar vertebræ. The neurotic spine is the condition which follows long-continued pain in the back. It is characterized by a superficial and variable tenderness, in contrast with the constant and definitely localized pain of the associated condition, which alone requires treatment. Sacro-iliac strain is relatively common. It is distinguished by the absence of tenderness over the sciatic notch, or of pain down the sciatic nerve, wherever else the pain may be felt. The patient complains that after sitting for a long time he feels pain over the back of the sacro-iliac joint and a sense of insecurity; pressure over the posterior superior iliac spine intensifies it. The condition is nearly always unilateral, and the only serious lesion to be excluded is the rare sacro-iliac tuberculosis. Most cases can be cured by manipulation; the remainder may need arthrodesis of the joint. Even after many years' duration complete cure may thus be obtained. Lumbo-sacral strain is quite different; the pain is localized horizontally across the back above the base of the sacrum. Tenderness on pressure is definitely referable to the tip of the spinous process of the fifth vertebra, and just below it. The only satisfactory treatment is said to be division of the affected ligaments, followed by active movements of flexion and extension of the lumbar spine. Lumbar back strain has a sudden onset; there is a point of localized tenderness over the erector spinæ muscle on one side. Treatment consists of immediate mobilization of the spine by manipulation under an anæsthetic, followed by massage and exercises. Spinal arthritis may be often confused with sciatica. There is tenderness over the sciatic notch and pain down the back of the thigh, but no prolongation down the region of the sciatic nerve. The treatment consists of manipulation under an anæsthetic, followed by radiant heat, massage, including passive movements, and exercises.—Abs. in *Brit. M. J.*

THE CANCER PROBLEM*

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III

IN Canada during 1931 there were 9,578 deaths from cancer, which means 92.4 in every 100,000 of population, or nearly 1 in every 1,000. In some provinces the ratio is a little lower, and in others higher. This must and can be reduced. It is up to the public and to the profession to see that it is reduced. The public must learn to pay attention to lumps, ulcers, and discharges, and to consult their doctor. When the doctor is consulted he must take a careful history, taking cognizance of all the symptoms and signs, separating the real from the imaginary; then the patient must be taken into his confidence, if a diagnosis of cancer has been made. As much hope should be held out as one can conscientiously declare. I have followed this practice for years, and as a rule patients are grateful for the frankness. Their relatives sometimes are not so thankful, preferring to have the doctor lie about it!

The medical profession, with the co-operation of the public, has practically stamped out diphtheria and small-pox; scarlet fever is not the scourge it formerly was; and typhoid fever is almost a thing of the past. Tuberculosis, while still with us, has diminished wonderfully, and I look hopefully to the future for the gradual reduction and final prevention of cancer.

The cause of cancer is as yet unknown. We have to learn first why in cancer the mechanism of "the unceasing proliferation of cells" goes on. Experimentally, cancer has been produced by various methods, and yet in all these this unceasing proliferation goes on and baffles the doctor. A few years ago at the Cancer Conference in London, Murphy, of the Rockefeller Institute, and the late Mr. Leitch, of the Cancer Hospital in London, reported, the one, that by passing a mild electric current through the testes and, the other, through the pancreas of chickens, they were able to secure something that was thought to be an enzyme from these organs, which when injected into other chickens produced cancer in 90 per cent.

Our only hope in the meantime is to deal with the individual cancer as we find it, for we know that when it first develops it is a purely local manifestation, and if the time comes when the surgeon is able to see it at this stage there will be a cure in well up to 100 per cent of the cases. Some people of course seem to have the unhappy faculty of developing cancer of different types. Many years ago I removed a scirrhous cancer of the breast; ten years later from the same patient I removed the clitoris and inguinal glands for epithelioma; ten years afterwards I operated for a malignant papillary adeno-cystoma of the ovary, with secondaries in the mesentery and in the omentum; but even then she lived for four years. Thus one may see three different types of cancer in the same patient. Is it possible, as has been suggested by Murphy and by Leitch, that there is in each of us some body fluid that under some sort of stimulus becomes cancer-producing? If there is, perhaps it will be discovered that each of us also possesses some "cancer-preventing" body fluid. This may be the reason why only one in each thousand develops cancer.

In the meantime success in treatment depends upon early diagnosis and early treatment. In this the public must assist. The doctor, because he cannot make a diagnosis until he is consulted, must see the case early. Then, if he is not sure, it is better far to remove the suspected area for microscopic examination than to wait until he can be positive, for then it may be too late.

We know that early superficial and skin cancers can be cured by various means, such as radium, excision, diathermy, etc., in the hands of an expert. We know that others may be cured by a combination of two or more of these methods. We also know that many may be cured by the knife provided they are seen before metastatic spread has occurred. I have seen some that have had no recurrence for almost thirty years; on the other hand I saw a patient of eighty-three with cancer of the breast, and she had a history of having had a local amputa-

* A paper read at the Annual Meeting of the Canadian Medical Association, at Saint John, 1933.

Other papers in this series can be found in the *Journal*, 1933, **29**: 465; 1934, **30**: 46, 50.

tion of the breast at twenty-three. This makes one hesitate about claiming cures.

The problem, clearly, boils down to early diagnosis and early treatment. That being so one is tempted to discuss the appearance of cancer in different situations. I would also suggest that each practitioner should send for a little book "The Truth About Cancer," published by John Murray for the British Empire Cancer Campaign. Keep this on your desk and read and re-read it daily.

Prevention of cancer is of course the ideal. For example, if there is a jagged tooth that irritates the tongue, it should be cleared up. The removal of gall-stones may prevent the formation of cancer in the gall-bladder; the removal of a gastric ulcer may prevent such becoming malignant. Primary cancer of the duodenum is so rare that one can afford to carry on medical treatment for ulcer to see if it can be healed, and this occurs in the great majority of cases. In cases of a tight prepuce, preventing the proper cleanliness of the penis, circumcision should be done. Great care is required after childbirth to see that the cervix is not left with lacerations that may ulcerate and sow the seeds of subsequent cancer. A persistent vaginal discharge should be investigated and cured; bleeding coming on after the menopause should be elucidated by a curettage, and if cancer is shown a hysterectomy should be done at once. When an ulcer appears in the mouth or on the lip it is not sufficient to find a positive Wassermann test, because cancer may have been engrafted upon a syphilitic ulcer, and *vice versa*. Some local anæsthetic and the ulcer snipped off for microscopic section is the proper course to clear up the diagnosis.

In approaching the study of a given case the history is almost as important as the examination. Take for example a breast with a lump in it. Did pain precede the discovery of a lump, or was the lump discovered accidentally? In the latter instance it is eight times more likely to be cancer. How long has it been in existence? Does the skin pucker over the lump? Is it tender upon palpation? Is there bleeding from the nipple? No lump in the breast should be treated until a positive diagnosis has been made. It should be removed (not cutting into the lump) and subjected to the microscope immediately, to determine what is to be the next step. Before beginning the operation permission should be obtained for a radical amputation if the lump is found to be cancer. As a rule a surgeon of experience can distinguish by the macroscopic appearance of the lump when sectioned in the operating-room, but when possible it is wiser to have the pathologist present to make a quick section.

If a patient comes complaining of *loss of "pep," loss of weight,* and *loss of appetite,* he should not be treated *medically* until one is able to exclude cancer of the stomach, for with that history cancer of the stomach will be found four times out of five. Even then sometimes the condition is so advanced that cure is not possible, but with modern surgery some cases that upon investigation look hopeless may be cured.

When a patient, whose bowels always have been regular, comes complaining of a gradually developing constipation, don't be tempted with some "favourite prescription", but make sure first whether there is a new growth in the large bowel. Another may present himself complaining that his bowels recently have become too free and that there is a good deal of mucus in the stools, or a sensation that the bowel is not emptied after a stool. A rectal examination with the finger will often reveal the presence of cancer of the rectum. When the diagnosis is made, radical treatment must be instituted at once. It takes courage on the part of the doctor to face the situation and explain to the patient, and if the patient will cooperate it is wonderful what can be done for relief and cure. He should have pointed out to him the operative mortality risk (6 to 10 per cent), and also the risk of leaving it until he gets worse. My experience with radium in such cases has not been satisfactory. A combination of radical surgery and radium may be useful in some cases, possibly the radium bomb, when we become more conversant with this helpful but dangerous remedy.

Suppose an institution for radium is to be developed. First, there should be attached to it a physicist, then a radiologist who understands radium therapy as well as deep x-ray therapy; a general surgeon and an internist, also an expert pathologist, are essential. For consulting purposes there should be a gynæcologist, an eye, ear, nose and throat specialist, as well as a dermatologist, for many of the cases are skin cancers that yield readily to radium treatment if skilfully handled. If there is not a skilled combination it strikes me that the less we have to do with radium the better. The doctor with a few milligrams of radium is dangerous.

THE EARLY DIAGNOSIS OF CANCER OF THE TONGUE AND LIP*

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IV

IN the clinical study of cancer, particularly of external cancer, it is always interesting and often instructive to make a brief survey of the knowledge of the profession with regard to this disease in the past. One hundred years ago, from the clinical standpoint, a surprising amount was known regarding cancers in general, and particularly those affecting the breast, lip and tongue. Even at that time several principles were laid down which hold good today. John Hunter, for example, declared that "a surgeon ought not to be contented with removing merely the indurated or actually diseased part, but that he should also take away some portion of the surrounding tissue in which a diseased disposition may probably have been excited." Sir Charles Bell stated that "age makes a great difference in the whole class of carcinomatous tumours, and the same disease distinguishable by obvious signs will run its course rapidly and with every symptom aggravated in a person of forty-five, while it will remain stationary for years in one of sixty or seventy." It was believed in general that local injuries and chronic irritations were predisposing factors. The clinical picture of cancer was particularly well described. The extension "through the medium of absorbing vessels" was described, and the fact that metastases occurred as a result, at a considerable distance from the site of the growth, was noted. With particular reference to cancer of the lip it was remarked that "irritation of tobacco pipes frequently gives rise to malignant or even truly cancerous diseases of the lip." Its frequency in the lower lip was remarked upon by Sir Astley Cooper, who said that he had seen only one instance of it in the upper lip.

In spite of the fact that the tongue is an accessible organ, there is a discouraging number of failures to recognize lingual cancer early. Diagnostic failures come about in two ways. First, the lesion is discovered, but not recognized as cancer; it is mistaken for some benign condition such as syphilis, traumatic ulcer or a simple wart; and, secondly, when the cancer is situated in the posterior third of the tongue it is much more difficult to detect than when it is in the anterior two-thirds, where it most frequently occurs. Cancer of the tongue is of vital importance to the profession because of its frequency and virulent character. Some authorities place it next to cancer of the stomach, uterus and breast in frequency.

ETIOLOGY

Cancer of the tongue is ten times more frequent in men than women. It is believed if the triad of syphilis, septic and carious teeth, and smoking could be controlled, 80 per cent of cancers of the mouth, tongue and lip would not occur. It rarely commences before the age of forty. A positive Wassermann test is present in a large percentage of cases. Quick found the Wassermann positive in 45 per cent of cases, Bloodgood in 20; other authorities give an even higher percentage. Leukoplakia is a definite pre-cancerous lesion, and while it may remain for years without becoming cancerous there is always that possibility. It manifests itself as a whitish plaque which spreads over the dorsum and side of the tongue. Fissures are prone to occur, due to the underlying fibrosis drawing the mucous membrane inwards. The papillæ are gradually shed and the tongue becomes unduly smooth. Excessive smoking is also considered to be an important factor in its causation. Nicotin has a decidedly irritating effect, producing chronic inflammation, local erosion, and, combined with the effects of heat and mechanical irritation in some cases, certainly has an influence in the initiation of cancer of the tongue and more particularly of the lip. The frequency of a positive Wassermann test in cancer of the tongue has led to a very unfortunate delay in many cases, in which an ulceration is treated as syphilitic for varying periods of time. When the cancer is definitely diagnosed it is often too late for any curative

* Previous articles in this series can be found in the *Journal*, 1933, **29:** 465; 1934, **30:** 46 and 48.

treatment. It cannot be too strongly emphasized that cancer and syphilis are frequently present in the same patient. In an adult a high percentage of chronic sores of the tongue and lip are malignant. It is inexcusable to treat them with silver nitrate or other caustic without making every effort to make a definite diagnosis and institute proper and early treatment.

THE TYPES OF GROWTH

Cancer of the tongue may commence in several ways:— (1) as an ulcer, with a warty, bare, hard indurated edge and thickening of the underlying tissues; (2) as an indurated wart; (3) as a cauliflower-like or papillomatous growth; (4) as an induration in a crack or fissure; (5) rarely, as a diffuse infiltration of the tongue, so that the tongue becomes hardened and puckered.

Leukoplakia undergoing malignant change shows at first a thickening of the patch, and finally ulcerates and infiltrates the tissues. It usually occupies a broad base and is superficial.

A simple papilloma, becoming malignant, shows a rapid increase in size, with infiltration of the base. Deep infiltration is early because the tongue is a muscular bundle and the frequent movements squeeze the cells throughout its structure.

Glandular metastases occur early and have been noted in some cases as the first signs. The superficial papillary type is slow to metastasize and gives the best prognosis. The glands involved are the submental, submaxillary, and deep cervical along the carotid sheath. It is remarkable that metastases seldom break through the lymphatic collar to invade the lungs, liver and distant organs.

The majority of cancers of the tongue are of the squamous-celled type, and usually preserve their adult characteristics, a fact which is of importance in deciding between radium and surgery as treatment. Rarely, the basal-celled type is seen. In the posterior third of the tongue a lesion with undifferentiated cells is observed, which accounts for its rapid infiltration, metastases, and the bad prognosis.

SYMPTOMS

Pain in the ear is not an unusual complaint in cancer of the tongue. In fact, many of these patients first consult the aurist on account of this. The tongue is supplied with sensation by the lingual and glosso-pharyngeal nerves. These nerves have communication with the sensory supply of the external and internal ear through the auriculo-temporal and Jacobson's nerve. In advanced cases with metastases pain in the ear may be due to infiltration of the cervical plexus by metastases in the cervical lymph glands. Difficulty in speaking is often an early sign, due to involvement of the tongue muscles. Salivation, fetor, pain in the tongue itself, and other signs eventually appear, but by the time they are present the condition is far advanced and hopeless. This helps to explain the fact that in some clinics 80 per cent of the cases are classified as hopeless when seen for the first time.

EXAMINATION

The tongue in a normal individual can be protruded one to two inches beyond the teeth. If the protrusion is limited it is evident, apart from sub-lingual inflammation and hypoglossal nerve paralysis, that a growth is infiltrating the muscles. A good light should be available. The surface of the tongue should be dried with a piece of gauze. The most common site for a carcinoma is on the side of the tongue, although it may occur on the dorsum or underneath. To detect an early carcinoma of the posterior third, the part must be examined with a laryngeal mirror and most important of all, by palpation. The regional lymph nodes, submental, submaxillary and deep cervical, should be carefully palpated. The only satisfactory method of detecting early enlargements of the submental or submaxillary lymph nodes is by bimanual palpation. One finger should be placed in the floor of the mouth and one below the horizontal ramus of the mandible. It is of the utmost importance to diagnose cancer early before the lymph nodes are involved. By the time they are involved the prospect of cure has enormously diminished.

BIOPSY

The section should be taken from the edge of the ulcer and should include some of the muscular tissue. Place the section at once in a bottle containing 2 per cent formalin and send it to the pathologist for a microscopic diagnosis. The advantages of a biopsy far outweigh the possibility of harm. Dissemination of cancer of the tongue through a biopsy has not been proven. Broder's method of grading carcinomas according to their activity, as evidenced by cellular differentiation and keratin formation, has been of great value from the standpoint of prognosis

and treatment. The slow-growing mildly malignant are designated as grade 1, and the successively more active growths are of grade 2, 3 and 4, respectively. In lesions graded 1, the local growth is, as a rule, readily controlled and extension to the lymphatics is not likely to occur. Carcinomas, graded 4, present rapid local growth, metastasize early and are prone to recur promptly after removal. They occur most commonly in the posterior third of the tongue, explaining the very bad prognosis.

Differential Diagnosis

The following lesions of the tongue must be differentiated from carcinoma:—

1. The *syphilitic ulcer* may be primary, secondary or tertiary. The chancre is very rare. Usually occurring in young adults, the ulcer is characterized by its button-like induration. There is a rapid and marked enlargement of the regional lymph nodes in the submental and submaxillary regions. The diagnosis is definitely made by finding the *Treponema pallidum* in smears taken from the base of the ulcer. Secondary syphilis manifests itself by the formation of mucous patches and superficial ulcers. The latter are multiple and situated on the side of the tongue. Similar ulcers are present in the mucous membrane of the cheek, soft palate and tonsils. They are small with a greyish base and sharply-cut edge, and often present a serpiginous outline. The tertiary stage presents more difficulties in diagnosis. Gummata occur frequently on the dorsum of the tongue and carcinomas on the lateral margin. A gumma commences as a swelling in the substance of the tongue. It softens and breaks down, leaving an ulcer with sharply-cut edges, and a base covered with a yellowish slough which resembles chamois leather. It is not hard and does not infiltrate the tongue. It heals rapidly under potassium iodide and salvarsan.

2. The *tuberculous ulcer* is rare. It occurs most commonly between the ages of twenty and thirty-five, when pulmonary tuberculosis is common. It is practically always secondary to pulmonary and laryngeal tuberculosis. The ulcer is most frequently situated on the tip of the tongue. The edges are undermined. The base is covered with pale flabby granulations and is not indurated. Pain is often a pronounced symptom. The diagnosis is definitely made by excision and microscopic examination.

3. The *traumatic ulcer* is caused by a sharp or decayed and jagged tooth. It is commonly situated on the side of the tongue. The ulcer is small, superficial and the base is not indurated. The ulcer promptly heals when the offending tooth is removed or filled.

4. *Dyspeptic ulcers* are associated with disorders of digestion. They are multiple. They are small, with a yellowish base and surrounded by an areola of inflammation. They are situated on the dorsum and side of the tongue. There are often minute ulcers on the gums and mucous membranes of the cheek.

5. *Actinomycosis* very rarely affects the tongue. It takes the form of a firm nodule or cellulitis. Softening and suppuration occur. The diagnosis is definitely made by finding the ray fungus in the discharge. This often takes much patience and many smears before it is seen.

6. *Ulcerative stomatitis* and *septic infection* of the teeth may be accompanied by small superficial ulcers. These are present on the gums and may be present on the lateral margins of the tongue. One type, very resistant to treatment, is produced by the organisms of Vincent's angina. It is diagnosed by taking smears and finding the fusiform bacilli.

Prognosis

The average duration of life in untreated cases is two years. According to Warren, Butlin and Meller carcinoma of the tongue terminates fatally in 75 to 90 per cent of cases. Sir Henry Butlin, in a review of 197 cases, found 27 per cent well for three to twenty-three years after operation. In an analysis of 777 cases Capetti found 20 per cent free from disease three years after treatment. In view of these statistics it is evident that much remains to be accomplished in the treatment of this lesion.

Carcinoma of the Lip

This is chiefly a disease of elderly men. Stastistics show that it accounts for from 3 to 5 per cent of all deaths from cancer. The lower lip is affected much more often than the upper, the ratio being 20 to 1. It is sixteen times more frequent in men than women, the reason not being definitely known. Chronic irritation, undoubtedly, plays an important rôle, such as the effects of septic or carious teeth, tobacco smoke, or the roughened stem of a tobacco pipe. Leukoplakia, keratosis and papil-

lomata are all pre-cancerous conditions and should be treated accordingly. Any ulcer or fissure which persists more than three weeks should at once arouse the suspicion of malignancy.

PATHOLOGY

Carcinomas of the lip are nearly all of the squamous-celled variety. Clinically, two varieties are recognized—the wart-like, projecting, type, and the ulcerating, infiltrating, type. As a rule, the more wart-like the cancer, the less its malignancy, and the more infiltrating, the greater the malignancy. Tumours near the mid line metastasize first to the submental nodes and those nearer the angle to the submaxillary group. A growth approaching the mid line is prone to form metastases on both sides.

DIAGNOSIS

The cardinal diagnostic points are first, a persistent sore on the lower lip, and, secondly, a lesion which when palpated with one finger in the mouth discloses a definitely indurated base, unless it be of the papillary variety, and, thirdly, a lesion in which the crust when removed shows a granular base having a tendency to bleed.

The differential diagnosis is between: (1) simple ulcer; (2) leukoplakia; (3) syphilis; (4) tuberculosis.

A *simple ulcer* is of short duration, and there is a history of trauma. The induration and granular base are lacking. *Leukoplakia* is definitely a pre-cancerous lesion. If fissure, ulceration, or induration is found, a biopsy should be done and the appropriate treatment immediately carried out. *Syphilis* is recognized by the rapid progress of the ulcer, with early and marked enlargement of the regional lymph nodes. A *tuberculous ulcer* on the lip is very rare. It occurs in younger people, associated with advanced pulmonary tuberculosis.

PROGNOSIS

Cancer of the lip is in one of the most favourable sites for cure, if it only be diagnosed early before metastases have occurred in the regional nodes. It is estimated that 90 per cent of cases should be cured by early diagnosis and treatment.

CONCLUSION

Any ulcer, wart, or induration around a fissure, or leukoplakic patch, occurring in middle-aged men, lasting more than three weeks, should be considered as malignant, until proved otherwise. It is only by having cancer as our *first thought*, and keeping a simple sore in the background that headway can be made in the cure of malignant diseases of the tongue and lip. The one vital and important step is the first one, *the early diagnosis*. A positive Wassermann test is not proof that cancer is not present. The probability that the lesion is cancer should be very seriously considered from the start, and should not be dismissed until the lesion is proved, without the shadow of a doubt, not to be cancer. Do not rely on radium, surgery or electrosurgery as curative measures unless an early diagnosis is made.

POLIOMYELITIC ANTIBODIES IN NORMAL ADULT SERUMS.—Two years ago Netter reported the prophylactic value against poliomyelitis of the serum of normal adults of regions where the disease had occurred in either epidemic or sporadic forms. A. Netter, C. Levaditi, and G. Hornus (*Bull. de l'Acad. de Méd.*, April, 1933, p. 529) present a further study of this subject, including a review of the results obtained by this procedure in countries other than France, notably in the United States and Canada. The virus used was fresh emulsions of the medulla of monkeys which had succumbed to injections of the medulla of a fatal human case. One g. of this was diluted in 20 c.c. of normal saline, and 1 c.c. of the emulsion was mixed with 1 c.c. of the serum; this was kept at room temperature, and then placed on ice for twelve hours; next day ¼ c.c. of this mixture was injected into the cerebrum of a monkey. If the animal showed no signs of the disease the result was termed "complete neutralization"; the appearance after a reasonable time of paralytic symptoms, susceptible of complete retrogression and not fatal, was termed "marked neutralization"; while the appearance of symptoms later than twenty days, with subsequent death, was termed "sensible neutralization." The results of 32 tests with 19 normal adult serums are summarized. In 15 personal cases complete neutralization appeared in 75 per cent, very marked in 5, appreciable in 10, and "no results" in 10 per cent. These results agree very closely with those obtained in other countries. In the present series it was found that the neutralizing power of the serum of subjects in close contact with the disease, such as parents, medical attendants, etc., was no greater than that of individuals with no known contact. The neutralizing property of these serums was probably due to the fact that the individuals had previously suffered from an unrecognized attack of the disease. As the neutralizing power of the serum differs in individuals, it is suggested that pooled serums should be employed in this treatment. That the serums of isolated subjects, notably of professional blood donors, possess this property is now established, and such serums may be employed in urgent cases where known serums are unavailable.—*Brit. M. J.*, 1933, **1**: Ep. 98.

BLOOD PRESSURE, NORMAL AND ABNORMAL*

BY J. M. LIVINGSTON,

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"IN adults a systolic blood pressure above 140 mm. in the male, or above 130 in the female, when it is more than transitory from physical exertion or emotional excitement, is looked upon as a pathological increase." This statement will be questioned by many, but it was made by Dr. Lewellys S. Barker, of Johns Hopkins University, in 1930. I shall endeavour to prove its correctness from insurance studies.

The insurance viewpoint of an impairment is different from the clinical but I believe they are never directly opposed to one another. Insurance medicine has benefited greatly from clinical studies, and in turn clinical medicine may well benefit from insurance studies. May I point out a few of the fundamental differences. Insurance is concerned with groups only, and the clinician is interested only in individuals. Life insurance studies mortality; all must die, but insurance attempts to determine the longevity of the various sections of a group. Clinical medicine deals with the comfort of the individual and his ability to perform useful work while alive. The final prognosis is the insurance problem; the immediate prognosis is the clinical problem.

Insurance medicine may fairly take credit for much of our knowledge of blood pressure, both normal and abnormal. I have reason to believe that a larger proportion of physicians in Canada and the United States than in any other country possess instruments for estimating blood pressure. While the majority of physicians can estimate blood pressure correctly I know there are many who find it difficult.

The history of blood pressure really begins with Stephen Hales about 1700. He tied tubes into arteries and veins of animals and estimated the pressure. The present method became generally available as a result of Riva-Rocci's instrument in 1897. Karotkoff, in 1905, published details of the auscultatory method, which made estimations of the diastolic pressure both easy and accurate. It was many years later before estimations of blood pressure became a regular routine procedure in clinical medicine or insurance examinations. A few insurance companies required systolic pressure readings in selected cases about 1907. Many companies had similar requirements by 1912, but the routine practice was not general until about 1918. About this time insurance companies began requiring diastolic pressure estimations.

The auscultatory method of Karotkoff is the most practical and widely used. Care should be taken to put the patient at ease. He should be comfortably seated with his arm bared to the shoulder and resting on a support so that the muscles of the arm and forearm are relaxed. The armlet is applied snugly, but not tightly, about an inch above the fold of the elbow. The cuff is inflated by small but rapid compressions of the bulb until the radial pulse is no longer felt. The stethoscope is placed over the artery just below the compression cuff, which is then deflated evenly. Five phases of the blood pressure can usually be identified. The first phase consists of clear-cut snapping sounds. The change to loud rough stenotic sounds is the second phase, which shows partial and at times complete disappearance. Then there is return of sound similar to phase one, but not so loud, and this is the third phase. The fourth phase is an abrupt dulling of sound or change from sharp pistol-shot to dull toneless sound. The disappearance of sound is the fifth phase. The beginning of the first phase is the systolic pressure and is usually 4 to 6 mm. higher than that estimated by palpation. The true diastolic pressure is the beginning of the fourth phase, but this is often difficult to determine, and especially so if the examiner is more or less tone deaf. Most insurance companies prefer to read the diastolic as at the beginning of the fifth phase, which is the disappearance of sound. We realize that this is not the true diastolic, but we make allowance for the necessary correction which is on the average 4 mm. In cases of marked aortic regurgitation or vasodilatation the fifth phase may be attended by a dull sound

* Read at the Annual Meeting of the Ontario Medical Association in Hamilton on May 31, 1933.

down to zero, then the diastolic pressure must be estimated at the beginning of the fourth phase.

It is not wise to delay long in making readings. The first trial may obtain approximate points only. It is important to deflate completely and have a short interval between attempts. King and Garrey, from experimental studies in physiology, state: "All systolic criteria agree sharply, regardless of variations in manipulative procedure. In order to make diastolic readings even of relative value, both compression and decompression must be carried out rapidly and uniformly."

A frequent source of error in cases with raised blood pressure is the "silent gap" which occurs usually in the second phase. This zone of silence may be absolute or relative, but generally begins 10 to 30 mm. below the systolic level, continues for 20 to 40 mm., and ceases at a point 20 to 60 mm. above the diastolic level. It can be produced to a variable degree by obstruction to the peripheral circulation, for example, through venous compression. Its mechanism is unknown, but it is sometimes associated with the shape of the pulse wave, as in the anacrotic or plateau pulse of aortic stenosis. Paul White has studied this "silent gap" in 30 cases; 26 had hyperpiesia, 2 had hyperpiesia and aortic stenosis, and 2 had aortic stenosis without hypertension. The average systolic pressure was 205 mm., the average diastolic pressure was 97 mm. and the average "silent gap" about 30 mm. The possible errors arising from the presence of the "silent gap" are that the systolic pressure may be recorded too low, when the compression has not been raised above the upper limit of the gap and similarly the diastolic may be recorded too high by mistaking the upper limit of the gap for the fifth phase. These errors can be avoided if one checks by the palpatory method and follows the sounds down to zero.

If several trials are made without completely deflating and waiting for about thirty seconds between readings you will get a venous engorgement with changes in blood pressure and also may find it difficult to identify the phases. A tight roll of clothing at the shoulder may make it impossible to estimate the diastolic level, by causing obstruction sufficient to produce sounds which can be heard to zero and so simulating aortic regurgitation.

The average blood pressure of adults of all ages has been found in life insurance examinations to be 127 mm. systolic and 83.5 mm. diastolic. Statistics offer authoritative evidence of the average blood pressure. The following Table gives the average variation of systolic, diastolic and pulse pressure with advancing age, by 5 year periods.

Age Years	*Systolic B.P.*	*Diastolic B.P.*	*Pulse Pressure*
10	100	67	33
15	115	75	40
20	120	79	41
25	121	80	41
30	122	81	41
35	123	82	41
40	125	83	42
45	127	84	43
50	129	85	44
55	131	86	45
60	134	87	47

You will note that the increase from age 20 to 60 is only 14 mm. for the systolic, 8 mm. for the diastolic, and 6 mm. for the pulse pressure. This rise in blood pressure may be viewed as a physiological expression of advancing years or as a sign of physical deterioration. Whether it is regarded as the expression of pathological changes, functional or anatomical, or both, nevertheless it reacts to the disadvantage of the individual.

While these figures give the average blood pressure for the various ages, I am not prepared to say they represent the normal blood pressure. From a clinical viewpoint one must allow for normal abnormalities depending on build, temperament, excitement, etc. From an insurance study we can say the best mortality is obtained in those whose blood pressure is somewhat lower than average. Even small variations in blood pressure have a definite effect on the mortality rate.

Systolic blood pressure in relation to average.....	−15	−10	−5	Av.	+5	+10	+15
Mortality experienced....	45%	39%	47%	46%	50%	73%	78%
Mortality, taking average blood pressure as 100%.....	87%	83%	102%	100%	109%	159%	170%

Dr. Fisher, of the Northwestern Mutual Life Assurance Co. reports on 3,390 cases with a systolic blood pressure of 100 mm. or less. He found a mortality of 35 per cent in this group,

and this was less than one-half of the general mortality of the Company.

We all know that from a mortality standpoint the average weight is not the best weight. Under age 35 overweights, if not extreme, show the best mortality; after 40 underweights have the advantage. Similarly, in healthy individuals, a blood pressure below the average from the standpoint of longevity is an asset. Sir Thomas Lewis says: "The average blood pressure rises with age; this is not to say that rising blood pressure is normal, for many vigorous and long-lived men retain low blood pressure; it is good that an otherwise healthy but aged man should show a pressure below the average for his years." An average expectancy of life may be had with average blood pressure; however if our blood pressure remains as for age 20 or even age 15 when we are 60 years old our prospect for a longer life is correspondingly increased. Consequently, there is justification in regarding a blood pressure below average as the normal. If individuals can perform their daily work with a blood pressure below average they are fortunate. There is less wear and tear upon their tissues, especially their blood vessels and the heart, making the tendency to longevity referred to readily understood.

Systolic blood pressures more than 10 mm. above the average are abnormal, and the extra mortality increases rapidly with further elevations.

Systolic blood pressure.....	+10 to	+15 to	+25 to	+35 to	+50 mm.
In relation to average.....	14 mm.	24 mm.	34 mm.	49 mm.	and more
Mortality met with.....	135%	184%	205%	248%	415%

Dividing by age cases with raised blood pressure, we find the greatest mortality increase in the fifth decade. Raised blood pressure is merely a sign which may be due to many causes —some organic, permanent, and prone to be progressive, others transient and functional.

Hypertension may be divided into three groups as to the order of appearance and seriousness.

1. The diastolic pressure is normal or nearly so, but the systolic is raised and the pulse pressure correspondingly high. This is the so-called stage of "essential hypertension" or hyperpiesia.

2. Both systolic and diastolic pressures are raised, with a pulse pressure above normal. Here we have pathological changes in the vascular system, especially the arterioles.

3. The diastolic pressure is high, but the systolic is dropping, giving a low pulse pressure. This is the stage of myocardial failure and may be present for some time without symptoms.

Frost, of the New England Mutual, found that 1.75 per cent of apparently healthy adults show increased blood pressure and that they group as follows:— No. 1—52 per cent; No. 2—44 per cent; No. 3—4 per cent. A careful investigation of these cases shows that in 6 per cent the raised blood pressure was temporary; in 16.8 per cent there was definite renal disease; in 2.5 per cent there was arteriosclerosis; 59.2 per cent might be classified as essential hypertension, but showed a heart murmur, rapid pulse, enlarged heart, or irregular pulse; many showed a combination of these impairments; 15.5 per cent were apparently true essential hypertension.

A follow-up of cases declined for high blood pressure showed 17 per cent with an improved blood pressure; 27 per cent definitely impaired, of whom 85 per cent had cardio-vascular renal disease; 9 per cent could not be traced; 35 per cent were too recent to expect changes; 12 per cent were dead.

Studying the causes of death, we find that 4 per cent died of angina; 8 died of arteriosclerosis; 17 died of organic heart disease; 22 died of apoplexy; 21 died of nephritis; 28 died from all other causes. A summation shows that 51 per cent died of cardio-vascular disease and 72 per cent of cardio-vascular-renal disease.

The systolic blood pressure shows the greatest variations. It is usually affected first, and estimations should not be subject to error. Persistent readings of more than 10 mm. above the average are not normal. When hypertension has existed for some time there is enlargement of the heart.

The diastolic blood pressure is more stable, and small variations are significant. It is, however, more difficult to estimate. When over 90 mm. it is suspicious; over 95 it is abnormal; 100 and over is definitely pathological; 110 and over usually means progressive kidney disease or malignant hypertension (Keith). I am of course referring to fifth phase diastolic readings. Diastolic pressure is of great importance. If high it means excessive constant strain on the circulation, and if it is abnormally low it means a serious handicap because of poor myocardial nutrition.

Pulse pressure is a composite of both systolic

and diastolic. A dropping pulse pressure usually means myocardial failure.

Pressure variations from beat to beat may occur with premature beats and in auricular fibrillation. When during normal rhythm regular variation occurs in alternate beats one can diagnose pulsus alternans. This is one of the most important signs of cardio-vascular failure and is easily shown by the sphygmomanometer.

Blood pressure, both high and low, appears to be a familial trait, and has been regarded as associated with special constitutions. The characteristics of low blood pressure subjects are a long narrow chest; they are easily affected by cold, easily tired, and of hyposthenic habits. The high blood-pressure subjects are broad-shouldered, broad-chested, athletic, of the John Bull type, and are of hypersthenic habits. Constitutional low blood pressure shows no tendency to become progressively lower, but so-called constitutional high blood pressure is liable to become permanently higher.

In my experience excitement from examination may cause some elevation of the systolic pressure, but the diastolic is not changed or is inclined to drop somewhat. Repeated readings at the same sitting usually show prompt return to the normal level; if not, one must conclude that there is an unusual vasomotor response to excitement. Such persons are disposed to react to strain in such a way as to develop a decidedly abnormal blood pressure. I believe this is probably the earliest evidence of future essential hypertension.

Sir Thomas Lewis, in his 1933 edition of Diseases of the Heart for Practitioners and Students, says: "The fingers should be trained to recognize a high tension pulse; for a pressure meter can hardly be used as a routine in general practice." I disagree with this statement. In the daily routine practice of medicine a sphygmomanometer is a necessity, as no practitioner with his finger tips only can estimate blood pressure accurately.

I have endeavoured to point out the value of blood-pressure estimations, to define normal and abnormal, and to give some reasons for these definitions. The figures I have given are lower than those generally accepted by the laity and the profession and I sincerely hope will not cause undue apprehension. In every case there is a clinical viewpoint requiring careful consideration.

SKIN LESIONS OF THE FACE*

BY EMERSON TROW,

Toronto

THE title of this paper may seem somewhat misleading as it is obviously impossible to describe in detail all the lesions affecting the face in so short a paper. I shall attempt, however, to describe a few of those conditions which I think are in part due to faulty circulation, which in turn is due to a variety of influences acting externally such as cold, heat, light, etc. To make my point clearer let us examine for a moment what these changes are.

Owing to the fact that the skin carries its vascular supply so close to the surface of the body it is obvious that external influences such as cold, heat, light and wind play some part in its vascular changes. Because of these vascular changes various alterations in the function of the skin must occur and where these vascular changes are most prominent, as about the cheeks and nose, one would expect to find certain clinical entities dependent, at least, in part, on this faulty circulation. Wetzel and Zotterman[1] investigated the nature of these changes and found that the stronger red colour of the face was not due to an increase in their number, but rather to a considerable dilatation of the capillaries as well as to collecting venules. Some adults show large numbers of such dilated vessels about the face and, granted that these external influences have produced certain circulatory defects, it is interesting to speculate what part each factor, light, heat, cold and wind played in their production. The protracted effect of cold and wind on the face, according to Haxthausen,[2] results in more or less vascular change which he describes as dilatation of the capillaries and collecting venules, whereas it leaves the arteries

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somewhat contracted. This effect, he states, produces a lowered skin temperature regularly aggravated in winter and improving in summer, a condition resembling chilblains. Lewis also, by capillary microscopy, was able to demonstrate marked dilatation of the capillaries and venules while the arteries were strongly contracted. This results in a blood flow that is very slow, with a lowered skin temperature. An additional factor in favouring venous congestion is dampness; a factor brought out so clearly in the case of ordinary chilblains; they improve immediately when central heating is adopted.

The effect of light on the circulation has been extensively studied and, according to Lewis, shows a tendency to dilatation of the arteries. A simple exposure using ultra-violet as well as heat rays produces an erythema which, if prolonged, may result in a blister and desquamation. Acute as this reaction is, more chronic eruptions may be brought about, such as eczema solare, even proceeding to the formation of bullæ. It is usual in these cases to find hæmatoporphyrin in the urine, though the amount may vary considerably. William H. Goekerman, Arnold E. Osterberg and Charles Sheard,[3] report a case of eczema due to light in which hæmatoporphyrin was demonstrated in the urine, and following a generalized therapeutic dose of mercury quartz lamp the urine contained two and one-half times as much. The more prolonged exposure to light and the weathering of those constantly exposed to sun and wind produces a somewhat different effect; and while vascular changes are noted other changes in the epidermal cells are just as important. Miescher[4] shows the defensive action of the skin to light, suggesting that the stratum corneum increases in thickness rather than that any increase in pigment content of the basal cells results. G. H. Percival and C. P. Stewart[5] in their work tend to agree with this finding of a thickened stratum corneum. W. Dyson[6] expresses the opinion that the effect of light on the skin is increased cellular activity, the products of which are carried into the general circulation, hence speeding up metabolism. Heyde and Vogt, quoted by Dyson, hold the view that in all probability burnt or damaged epithelium might act when absorbed as a foreign albumin and produce a hypersensitiveness, in other words, an anaphylactic state. Dyson does not believe that the effect of light is on the nervous system; otherwise the dilatation of the capillaries would begin immediately. The beneficial effects of x-ray treatment in eczema of the dry itchy type Dyson explains as causing small repeated doses of the sensitizing agent to be absorbed in this way, producing an anti-anaphylactic state.

Those constantly exposed to the sun, especially fair sallow people, sometimes develop dry hard crusts on the uncovered parts. The dark greasy spots which so frequently occur on the face of those past middle life are usually called senile warts. It may be months or even years before, on lifting this crust, a small shallow ulcer is observed and each time the crust forms and is removed it is larger. The timely removal of such a lesion may easily be done by curetting, radium, CO_2 snow or excision; and removal by any of these methods will save a deeper and more extensive operation. Most of the horny and the hard excrescences about the face are better removed, as by removal a potential rodent ulcer may be eliminated.

It is noted that the areas most affected by light, heat, cold and wind are also the areas affected by blushing; which brings to our consideration the nervous mechanism in its control of facial vessels. These factors tending to produce central redness, slowing-up of the blood flow, and an atonic condition of the vessel, allow toxins to concentrate or act for a longer period; they also tend to embolic deposits and, further, if sensitization of the tissues has occurred, the reaction is concentrated in these areas. This sensitization is a particularly common occurrence following the use of various cosmetics, dyes, bleaches, creams, after-shaving lotions and plants, when simple irritants are concerned; but it is not unusual to have sensitization in this area to the spores of seborrhœa, the invasion of bacilli as acne and the ordinary forms of staphylococcus. Circulating toxins and organisms may also select this area; instances may be seen in drug eruptions and in the various forms of tuberculides.

Some time ago I attempted to estimate the state of the vessel walls in various conditions of the skin. This was done by using a capillary resistance test. In certain conditions—rosacea, erythema multiforme, seborrhœic dermatitis—a fragility of the vessel wall was noted, as evidenced by the production of petechial hæmorrhages more often than in normal people or in those whose diseases affected other sites

than the face. It may be, however, if we already have dilated capillaries, that any back pressure would cause rupture and petechial hæmorrhages. That these petechiæ would appear elsewhere, as on the arms, might appeal to some as suggesting a general lack of tone and fragility of the vessel wall. It is my belief that such is the case in rosacea, lupus erythematosus, light-sensitive persons, seborrhœic dermatitis, and probably a number of other conditions.

Eczema of the face in infants.—In discussing the cause of this common disorder its situation on an exposed part is at once obvious and would lead one to suspect an external influence, especially exposure to low temperatures and cold winds. Picard[7] states that in Louisiana it only occurs during infrequent cold spells. It seems just as certain that the heat of warm rooms, causing an erythema of the readily flushed face, may produce it. A few cases seem to be aggravated by light and cases of light-sensitivity have been observed in cases previously infantile eczema. The relation of pus-producing organisms, such as the pityrosporon of Malassez, in the cause of infantile eczema is frequently observed. The scaliness of the scalp before the appearance of the eczema is a common observation.

SUMMARY

1. The effects of light, heat, cold and weather on the vessels of the face are discussed.

2. It is suggested that these circulatory changes favour the production of certain lesions of external and internal origin.

3. It is suggested that the fragility of the vessel wall may not be entirely a local, but a general one, as evidenced by capillary resistance tests in a number of diseases affecting these areas.

4. The nervous control of these vessels is also noted.

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DIVERTICULITIS*

BY E. H. SHANNON, M.B.,

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DIVERTICULA may occur at any point in the gastro-intestinal tract—the œsophagus, stomach, small bowel, colon, even in the appendix—and inflammation may anywhere supervene. I propose to discuss the condition briefly from a radiological standpoint as it is seen in several of these locations, though the occurrence of inflammatory processes in diverticula arising elsewhere than in the colon is, in my opinion, of secondary importance.

THE ŒSOPHAGUS

In the œsophagus the majority of pulsion diverticula are found in the region of the introitus, due, it is believed, to the relatively thin musculature in that region. They usually occupy a posterior position, but may be laterally placed. Their size varies greatly, from a lesion barely detectable in a roentgenogram to one which has attained a diameter of three or more inches. Roentgenologically, they may be demonstrated by the opaque meal or barium paste, unless already filled with retained food, in which case they may not be readily detected at an initial observation. Usually the mouth of the diverticulum is situated well above its most dependent point, permitting of easy visualization by the radiologist, and incidently causing food-retention, regurgitation, and occasionally pressure symptoms in the patient. The lesion is usually seen as a smoothly contoured structure arising from the œsophageal lumen, globular or ovoid in form, presenting a fluid level and retaining a barium content after the ingested meal has passed through the segment from which it arises.

The so-called deep-seated diverticula, similar in every respect to those already described but arising from a lower level in the œsophagus, are more uncommon and occur with greater frequency in the male sex, a fact for which no sufficient explanation has been advanced.

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These cases are probably accounted for largely on the ground of congenital deficiencies of structure, excluding those instances of known relationship to trauma. The deep-seated variety occurs usually in the anterior wall of the œsophagus and on the right side. The size attained may be such that the diameter of the sac is larger than the transverse diameter of the cardiac end of the stomach. On the other hand the lesion may be quite small.

The appearance produced by these lesions may be simulated more or less closely by the dilatation occurring at times above an organic stenosis, benign or malignant. Occasionally, especially above a benign constriction, one may find considerable dilatation, which, if pendent, may present a pocket harbouring a barium content. The nature of the condition will be recognized when the causative factor is identified.

A second variety of diverticulum, known as the traction type, occasionally occurs in the œsophagus, most frequently in patients having tuberculous glands around the lung roots. In the course of the past seven years I have observed only two cases which might be so classed. Both occurred in patients having pulmonary tuberculosis, and were due doubtless to the juxtaposition of tuberculous lymphatic glands undergoing fibrosis. As is often the case, both lesions were quite small and were not productive of symptoms. Tough connective-tissue strands, known as Ribbert's bands, at times connect the anterior œsophageal wall with adjacent calcified tuberculous glands. Traction diverticula may be distinguished from the pulsion type by the fact that their outermost point is usually tented and often irregular. They may project directly outwards, while the pulsion type usually assume a dependent position.

THE STOMACH

The occurrence of diverticula in the adult stomach is so rare and relatively unimportant as to deserve only passing comment. Small *true* diverticula, true in the sense of containing all three coats of the stomach, have been reported, arising in the pylorus or close to the œsophageal orifice. They present pouch-like protuberances from the barium shadow, rounded in contour but otherwise resembling at times the pocket of a perforated ulcer.

Lewis and Thyng[1] have observed the frequent occurrence in the fetus of diverticula arising from the stomach, duodenum and jejunum, having at their tip small masses of cells identical with those forming the pancreas, itself embryologically a diverticular outgrowth of the alimentary tract. Normally all such cells degenerate, except those connected with the ducts of Santorini and Wirsung. It would seem, as Moynihan remarks, that a number of efforts were made to develop the pancreas, and that when the normal regression fails to occur such buds may persist into adult life, each having a minute accessory pancreas attached. Moynihan[2] described two cases of gastric diverticula arising from the greater curvature, the neck large enough to admit the tip of the finger, the floor containing an island of pancreatic tissue. When inflamed, as a result of food retention, or other cause, gastric diverticula may give rise to symptoms indistinguishable from those of gastric ulcer.

THE DUODENUM

In the duodenum diverticula are of common occurrence. They may be seen arising from the descending limb, the transverse portion, or the caput, in that order of frequency. They are usually fairly small—one to two centimetres in diameter,—but may attain a very large size. It is thought that some are congenital and some acquired, the former associated with the development of small accessory pancreatic buds, the latter caused by structural weaknesses, usually in the descending duodenum around the ampulla of Vater. Spriggs[3] found duodenal diverticula 38 times in 1,000 consecutive gastro-intestinal examinations. As may be imagined from their appearance in a roentgenogram they lie close to and frequently within the substance of the pancreas. Fortunately, the advent of inflammatory change is infrequent. As in the œsophagus, a false type or pseudo-diverticulum may develop proximal to an obstruction, in or beyond the caput. This variety occurs most frequently as a result of stenosing duodenal ulcer, and is sometimes mistaken for the true type. The recognition of an ulcer or its scar obviates the difficulty.

THE COLON

Incidence.—The frequency of diverticula in the colon and the possible complications which may ensue following the onset of inflammation give to the condition in the large bowel an im-

portance which it does not deserve elsewhere. Statistics on incidence vary rather widely, however. Spriggs and Marxer[4] reported a series of 1,000 colon investigations, in which 10 per cent showed diverticula, while Larimore in 1925 reported 4,406 consecutive radiographic examinations of the colon of which only 1.24 per cent showed diverticula. Rankin and Brown, of the Mayo Clinic, found diverticulosis 1,398 times in 24,620 examinations, an incidence of nearly 5.7 per cent. A review of the last 500 cases of colon examination at St. Michael's Hospital showed that diverticula were present in 3.6 per cent. The patients were characteristically in middle life. It has been estimated, both from radiological and autopsy data, that about 15 per cent of cases of diverticula of the colon are productive of symptoms—that is, that inflammatory changes occur.

The sigmoid colon is involved most frequently, the cæcum and appendix least, the ascending and transverse colon occupying an intermediate position.

Method of examination.—The barium enema is usually employed as for the diagnosis of other colonic lesions, and is found to be rapid and usually accurate. Occasionally, small sacs may best be demonstrated by the opaque meal which lies in the colon a longer time and may obtain entry to a sac which was filled with fæces at the time of administration of the enema. Infrequently, the so-called double contrast enema will show the relation of suspected sacs to the lumen of the bowel better than by any other method. This procedure is carried out by moderately distending the colon with air after the usual barium enema has been partially expelled. It insures the filling out of the haustral markings and eliminates pseudo-diverticula produced by the retention of barium at their apices. If the meal is used the diverticula may not fill until the second or third day, at which time a barium enema or insufflation of the colon with air will clearly show the relation of the sacs to the bowel wall. If the enema alone is employed it should be retained as long as possible after allowing the patient to evacuate enough of it to avoid distress.

Radiological findings.—The x-ray findings are based on the fact that a normal colon presents haustrations of symmetrical pattern, due to the contraction of muscle fibres, when studied after administration of an opaque meal or enema. The segmentation produced affects all the coats of the bowel, even the peritoneal covering dipping slightly into the depressions. When normal the haustral markings are equidistant from the centre of the lumen, the indentations are not excessively deep—usually about half the diameter of the bowel—and adjacent lobulations are approximately equal in size. Normally, during mass movements, and, pathologically, as a result of local irritation or induration, the contraction of the muscle fibres is altered or abolished and the haustral markings are changed. Such a condition is found in colitis, the colon assuming in the more severe cases a distinctive ribbon-like appearance. In diverticulitis also more or less characteristic changes occur.

The radiologist, having demonstrated the presence of diverticula, is confronted with the task of determining the presence of diverticulitis. He will probably be prejudiced to some degree by the fact that the patient whom he is examining must have symptoms demanding investigation to explain his being submitted to x-ray investigation. The changes in and about an inflamed diverticulum are, however, sufficiently well demonstrable to enable him to form an independent opinion.

The changes to be observed were first described in 1927 by Spriggs and Marxer.[4] Three stages in the development of diverticulitis may be identified. The first is characterized by minute herniations of the mucosa into the submucous coat and between the muscle fibres, as a result of weakening of the latter structures, the process being characterized radiographically by the protrusion of minute irregularities from the ends of one or more haustral markings and by slight alterations in the size and shape of the haustral contours. If localized, the process may not be productive of symptoms. A stage of irritation is next seen, giving a larger concertina-like appearance to the area involved, the sacs meanwhile remaining small. This stage is in turn followed by the full-blown diverticula. All three stages may be seen close together in the same segment or in different parts of the colon. George and Leonard have also described a serrated saw-toothed appearance which one occasionally sees persisting in a small segment of bowel, not only, as the authors believed, in association with invisible sacs but also preceding their formation. This appearance characterizes

the so-called irritable colon and is analogous to the initial stage described in the foregoing.

Whether acquired or congenital, diverticular sacs may be large or small, wide- or narrow-necked. If the neck of a sac is narrow its contents are extruded with difficulty, even when a muscular coat is present. Stercoliths are prone to develop and inflammatory changes occur. Such changes are shown early by a pouting of the neck of the sac into the haustral lumen, later by fixity of contour of the sac, even during marked peristalsis of adjacent segments of bowel, resulting from a peri-diverticulitis. Spiking or sharpening of the fundus of the sacs occurs with fixation and thickening of the bowel wall, especially if the diverticula are numerous. Such thickening is indicated by a decrease in size of the barium-filled lumen. The chronic, localized, adhesive peritonitis which ultimately supervenes limits the mobility of the colon. The inflammatory process may finally cause complete obliteration of diverticula in a segment obviously pathological, while resulting in tumour formation and the production of a filling defect. No diverticula may be present elsewhere in the colon. Such cases may show radiographically a marked resemblance to carcinoma. In malignant disease the involved segment is apt to be short and to present more sharply irregular contours, but a definite differentiation is made at times with great difficulty. In these instances the clinical history is of the greatest value. When in doubt it is the part of discretion to consider the lesion malignant until proved otherwise by repeated radiological observations or by the surgeon. It should be observed that the cases in which such a difficulty may exist are those most suitable for surgery, that is, those presenting well localized areas of diverticulitis showing hyperplastic change. The possibility of the coincident existence of carcinoma in an area of diverticulitis must also be remembered, though the production of malignant disease from the inflammatory process is much disputed. In this connection a quotation from a recent publication by Rankin, Bargen and Buie[5] is of interest: "There is little evidence to support the view that carcinoma is the result of diverticulitis. Indeed, the association of the two lesions is so uncommon that one may question the diagnosis of carcinoma associated with diverticulitis, except under the most extraordinary circumstances." The authors report that of 227 cases of diverticulitis of their series coexisting carcinoma was found in only 4, and that of 679 cases of carcinoma only 4 showed diverticulosis.

REFERENCES

1. LEWIS AND THYNG, Quoted by Moynihan.
2. MOYNIHAN, *The Lancet*, 1927, 1: 1001.
3. SPRIGGS, *Quart. J. Med.*, 1925 19: 1.
4. SPRIGGS AND MARXER, *The Lancet*, 1927, 1: 1067.
5. RANKIN, BARGEN AND BUIE, The Colon, Rectum, and Anus, W. B. Saunders, Philadelphia, 1932.

ARTERIOGRAPHY.—Th. Naegeli (*Deut. med. Woch.*, August 4, 1933, p. 1196) discusses the history and uses of arteriography. An ideal contrast-medium for arteriography must have no local deleterious effect on the vessel, must be inert pharmacologically, and must be opaque to x-rays. The solutions in general use are 40 per cent uroselectan, 22 per cent abrodil, and thorotrast. The smallest quantity sufficient to produce filling of the required vessel is injected under local anæsthesia and rigid aseptic precautions. Radiograms are taken in the normal way, serially or cinematographically, the latter giving some idea of the functional condition of the vessels. The practical value of arteriography is said to lie in the exact diagnosis of arterial disease, especially in the differentiation of spasm and organic disease in such conditions as intermittent claudication. Emboli or thrombi can be accurately localized, and the condition of the collateral circulation determined before amputation, thus giving some guide as to the level at which to amputate. Encephalo-arteriography (injection of contrast-media into one or both internal carotid arteries) has also proved of value in localizing cerebral tumours and is, it is claimed, safer than encephalography, while injection of contrast-media into the aorta by a similar route to that used for splanchnic anæsthesia has thrown light on some obscure abdominal tumours. Finally, by passing a fine catheter up the cubital vein to the right side of the heart a filling of the pulmonary arteries may be obtained which is said to localize lesions in the lungs more accurately than bronchography in some cases.—Abs. in *Brit. M. J.*

ARTERIOGAPHY AS A THERAPEUTIC MEASURE IN VASCULAR DISEASE OF THE LIMBS.—R. Demel and M. Sgalitzer (*Wien. klin. Woch.*, August 18th, 1933, p. 1017) discuss the use of arteriography as a therapeutic measure in some vascular diseases of the limbs. During investigation of cases of endarteritis obliterans, thrombo-angiitis obliterans, peripheral arteriosclerosis, and angiospasm, improvement was noticed in some cases after this measure. This observation has been pursued further, and, in a series of 58 cases, intra-arterial injection of 40 per cent uroselectan or 20 per cent abrodil caused definite improvement in 21. Improvement in the colour and surface temperature of the limb was usually rapid. Pain was considerably diminished, and the patient was enabled to walk further. In one case arteriography caused such improvement that amputation, which had seemed inevitable, was not necessary. The failure consisted chiefly of advanced arteriosclerosis or endarteritis obliterans.—Abs. in *Brit. M. J.*

Case Reports

APPENDECTOMY WITH POST-OPERATIVE PERFORATION OF THE STOMACH CAUSING FATAL HÆMORRHAGE

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I am reporting this case for I have never seen one like it before, and also because, as far as I can learn from the literature, it is a rather rare and fatal condition.[1]

On October 14, 1933, at 5 a.m., I was called to see an old lady of 66. She told me she had been seized with cramps in the upper part of her "stomach" the evening before. They continued all night and did not allow her much rest. At 4 a.m. they became much more severe. She was slightly nauseated but did not vomit. When I saw her she had tenderness on palpation slightly above the umbilicus, with somewhat less tenderness in the right lower quadrant. There was also some rigidity in these areas. The rest of her abdomen was quite free from pain and quite soft on palpation. No rebound pain was elicited at this examination. Her temperature was 100°, pulse 115, and respirations 22. She had had three bowel movements the day before, as was usual with her. The colour and consistency of these stools were quite ordinary. Feeling that this was a clear-cut case of appendicitis I advised her to go to the hospital for operation. This she refused to do, one of her reasons being that she had had attacks of pain like this many years ago when she was living in Switzerland, and that her doctor told her she had appendicitis and if she was operated on she would die. Being unable to persuade her to undergo an operation I put ice-bags on her abdomen and gave her sedatives. When I saw her again at noon she was better; her temperature was normal, and her pulse 96. Then at night again when I visited her she was quite improved. The tenderness in the abdomen was much less, and there was very little resistance anywhere on palpation. Her temperature now was 99.8° and the pulse 100. Her bowels moved once and the stool was normal in colour. She herself felt considerably better. My feeling then was that she was going to get well without an operation. At 1.30 p.m. the next day I was called again. She had had a fair night, but at 10 a.m. her cramps began again and were very severe. This time they were felt mostly in the right lower quadrant. She was suffering a great deal of pain. She had nausea but no vomiting. On palpation she was exquisitely tender in the right lower quadrant. There was also some tenderness around the umbilicus. The right lower quadrant was very rigid. The rest of the abdomen, apart from slight resistance above the umbilicus, was quite soft and free from pain. She looked toxic. A diagnosis of perforated appendix was made. She and her family wede advised that her only chance of getting better was to be operated on. After considerable persuasion she consented to go to hospital, and was admitted to Youville Hospital at 3 p.m.

The principal points in her clinical history are as follows: (1) she was too old a lady for a good operative risk; (2) she had had attacks of pain in the abdomen before. Her last attack was last April, when I attended her. It was similar to the present attack but not quite so severe. It subsided under treatment after she had refused to be operated on or go to hospital. After recovering from this attack she was able to carry on with her house-work as before. (3) She was obese; (4) for years she had been troubled with shortness of breath; (5) she complained of nocturia; (6) on occasions she used to have neuralgic pains in the shoulders, arms, and lower back; (7) now and then she complained of some discomfort in the epigastrium after eating.

The chief positive points in her physical examination were: (1) obesity; (2) orthopnœa. There was cyanosis of the lips and fingers. Her face was darkish in colour. (3) Her temperature was 101.2°, pulse 120, and respirations 24. (4) Her heart was enlarged one finger's breadth to the left. The sounds were well heard, rapid, but regular in rate and rhythm. No heart murmurs were heard. Her blood pressure was 190/110. There was no œdema of the dependent parts. (5) In her lungs there were a few scattered rhonchi. At the left base there was evidence of an old pleurisy. (6) Her abdomen was as described above; *viz.*, pain and rigidity

were confined to the right lower quadrant and around the umbilicus; otherwise the abdomen was quite soft. There was no tenderness or resistance in either loin, even although she complained of pain in the loins. A rectal examination was not made. (7) Her urine contained granular casts (these were also found last April); it contained no albumin and no sugar. (8) A white blood cell count was not done. (9) Her nervous, lymphatic, and integmentary systems were normal.

As soon as she was ready after admission she was taken to the operating room. Under ether anæsthesia the usual McBurney incision was made. On opening the peritoneum some foul-smelling pus escaped, having the colon-odour. The appendix was found lying over along the root of the mesentery and toward the mid-line. It was quite easily delivered. It was gangrenous and necrotic along its whole course. Even the base of the cæcum shared in part of this gangrenous condition, so some difficulty was encountered in getting the purse-string to hold after the appendix had been removed and its stump ligatured. However, I covered the gangrenous area of the cæcum with what was left of the meso-appendix and hoped that a fæcal fistula would not later develop. The pelvis was dried with sponges. Then one drain was inserted into the pelvis and another in the fossa in which the appendix lay. No further exploring was done, but from what was seen of the small and large bowel I should judge that the peritonitis was limited to the right lower quadrant. The patient's condition throughout the operation was poor. Her blood pressure dropped to 120, and her pulse became more rapid. Some difficulty was encountered in closing the wound because we were afraid to give her much more anæsthetic for fear she would die on the table. However, we closed her up, applied dressings, and brought her back to the ward.

On return to her room she was very much cyanosed; her respirations were rapid, and her pulse weak and rapid. Her forehead was covered with cold clammy sweat. A large rectal saline given her was returned," light green fluid with few fæcal particles." We then gave her an interstitial injection of 1,000 c.c. of normal saline. This was well absorbed. About two hours afterwards I again saw her. Her pulse was still rapid, 150, and of poor volume. Her extremities were cold. She still was quite cyanosed and her face was covered with cold clammy sweat. She was started on cardiac and respiratory stimulants. Morphia, gr. ¼, was given about midnight and again at 7.45 a.m. She had a fair night. When I saw her again next morning her pulse was 120, respirations 28, and temperature 103.6° by rectum. Her lips and hands were quite cyanotic. Her lower abdomen was soft. The incision area looked all right. She was conscious and stated she felt better. We decided that digitalis would improve her circulatory condition, so she was given m. xxx. For about an hour her condition was slightly improved. Then she suddenly became more restless and tossed herself about in bed. The cyanosis deepened. Her skin became again cold and clammy. Her pulse became more rapid and irregular, and her respirations went up to 46, and temperature by rectum to 104°. She tried to get out of bed. She had air-hunger. This condition became worse and worse and she died at 11.40 a.m.

From the clinical picture exhibited by this patient, in spite of the air-hunger and the suddenness of her change for the worse, my impression was that death was caused by cardiac failure and general toxæmia. From the onset of her illness she was cyanosed. Further, from the onset of her illness till her death she never vomited or even strained to vomit.

To my surprise, the autopsy, performed by Dr. J. L. Bouillé, Coroner, revealed the startling and interesting findings of a perforation of the posterior wall of the stomach with a large quantity of blood in the lesser sac. The following is an abstract from Dr. Bouillé's report.

"Incision of the thorax and abdomen revealed a large amount of coagulated blood in the epigastrium, and on the posterior aspect of the stomach a small perforation due to a recent ulcer. There was no inflammation in the neighbourhood. Nothing abnormal was found in the lungs, heart, liver, gall bladder or spleen. At the point of operation in the abdomen there was no pus or blood. The intestines, kidneys, and pelvic organs were healthy.

"Death was to be attributed to hæmorrhage secondary to perforation of the stomach."

COMMENT

Having followed the patient through two attacks of abdominal cramps I feel that she had no symptoms and no signs of peptic ulcer before the operation. That she did not have a perforated stomach ulcer before operation I am also certain. That it must have perforated about one and one-half hours before death, when

she suddenly became worse, is also my conviction. That the ulcer was acute with no induration around it is borne out by the examination and above report of Dr. Bouillé. The cause of this acute perforation I cannot explain. The patient certainly exhibited a condition of profound toxæmia. Whether sepsis, embolism in the stomach wall, or the effects of the ether anæsthesia with auto-digestion of the stomach wall, was responsible for this fatal complication I am unable to say. One thing is certain, however, that such a condition occurred within 18 hours after operation indicates a rather rapid process.

REFERENCE

1. MOYNIHAN, Abdominal Operations, Saunders, Phila., 4th ed., Vol. I, 1928, pages 105 to 109.

A CASE OF POISONING WITH A DERIVATIVE OF BARBITURIC ACID

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A woman, 39 years of age, took, as far as I could ascertain, about 12 tablets, the equivalent of 18 grains of "Dial", a well known brand of barbituric acid derivative. In the literature, the maximal dose of this particular hypnotic is given as 4½ grains. The drug was taken about 6.30 p.m., during the absence of the woman's husband. On the latter's return about 8 p.m., just before she collapsed and went into a comatose state, she informed him of what she had done. I was then called, but at the time was out visiting, and it was about 9 p.m., or a little after, before I first saw the patient. I found her cyanosed, with respirations only 6 to 8 per minute, the eyes fixed, pupils dilated, the reflexes gone, and the skin cold and clammy. Coramine, 3 c.c., was at once injected intramuscularly, a cold bath was given, and in a few minutes the pulse became fuller and stronger, the respirations became good, her colour nearly normal, and there was some return of the reflexes. The patient could be awakened and was kept awake by walking (forced) and being talked to for the next four hours. The worst seemed to be past and she was allowed to go to sleep. She slept for 14 hours and on awakening was somewhat incoherent. Around 3 p.m. the same afternoon I called to see her again and administered another 3 c.c. of coramine intramuscularly. The same evening she was again quite rational and practically recovered. The next day she felt a little drowsy, but further recovery was uneventful.

In perusing current literature I find that Killian reported at the 1931 German Surgical Congress on the remarkably strong analeptic action of coramine in respiratory and circulatory failure occurring occasionally in avertin narcosis. The same author, also Crohn, Glaeser, Halbfas-Ney, and others found that the peculiar action of coramine was not limited to accidents in basal anæsthesia, but was applicable against all substances with a narcotic action, to a greater or lesser extent. Glaeser (*Med. Klinik* No. 15, 1932) reports probably the most severe instance of poisoning by barbiturates. This was a patient who had taken not less than 30 tablets of luminal, 120 drops of somnofen (orally), 5 to 6 of the 2 c.c. luminal ampoules, and 6 pernocton ampoules intramuscularly and possibly still other hypnotic mixtures. Three intravenous doses of 5 c.c. of coramine brought about recovery.

Killian writes in the *Klinische Wochenschrift,* February 4, 1933, that in all conditions of poisoning by narcotics, as well as post-anæsthetically and post-operatively, coramine has been most successful in overcoming the condition of depression of the vasomotor and respiratory centres. Circulatory and respiratory collapse from the most varied causes could be successfully combated with coramine. He illustrates statistically the extraordinary reduction in the number of suicide fatalities and anæsthesia accidents. There had been reported 150 cases of the most severe asphyxia or collapse, 32 anæsthesia accidents, 41 cases of circulatory and respiratory collapse in association with internal diseases, and 77 cases of poisoning in attempts at suicide, in which coramine had been employed in large doses, generally after the failure of other agents. In 68 of these patients the condition appeared to be so hopeless that it could be said that coramine exercised a truly life-saving action. The number of fatalities from poisoning became very low; in all, there were 15 out of the 77 most severe cases where treatment was instituted too late, and where there was, in addition, double pneumonia, which could not be successfully combated. In other instances there were complications such as apoplexy, renal insufficiency, heart disease, hæmorrhage in the basal ganglia, associated with the unfavourable outcome.

Clinical and Laboratory Notes

THE STANDING POSITION AS AN AID IN REPLACING THE RETROVERTED UTERUS

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Women normally constitute a large proportion of one's practice and, at some time or other, may require gynæcological examination, which in some instances will reveal evidence of uterine displacement. It would seem rash, therefore, to presume that anything could be added to the technique of so common a procedure or to the management of so frequent a disorder. Fortunately, we have passed the stage where we believe that the pelvic organs are responsible for all the ills to which women are subject, or that the presence of a uterine displacement is an explanation for all symptoms, pelvic or general which the patient may present, and that immediate steps for its correction must be taken. There is, however, a definite group of patients in whom uterine displacement causes symptoms and where correction of this brings relief.

We are familiar with the usual positions advocated for pelvic examination—the lithotomy, the dorsal, the semi-prone and the knee-chest—and with the use of bimanual manipulation in attempting to replace the retroverted uterus. It is often difficult, however, to accomplish one's purpose. The principles in replacement are (1) pushing the cervix back and up, and (2) bringing the fundus forwards and down. This second requirement frequently is elusive, for the uterus may merely recede into the hollow of the sacrum and refuse to be coaxed forward. To dislodge it the cervix may be pulled down by means of a volsellum. When this fails the knee-chest position or general anæsthesia is advised.

In this whole group the standing position is of distinct value. It is comparatively easy to push the cervix back and up, thus forcing the body of the uterus out of the hollow of the sacrum, and then gravity and the force of intra-abdominal pressure will assist in tipping the fundus forwards and down around the axis of the cardinal ligaments. If necessary, the patient may stoop forwards and bear down, thus aiding the tilting of the uterus into its normal position. It is then simple to satisfy oneself that the organ has been completely replaced. This method will not be successful in replacing the uterus bound by inflammatory adhesions, but it causes less discomfort than the knee-chest, or even the dorsal position, and is as efficacious.

However enthusiastic we may be about the surgical management of retroversion, there are many patients who will respond to non-operative replacement, with or without the use of a pessary. There are many others who, for one reason or another, will not submit to an operation, but who appreciate the relief afforded by mechanical support. After correcting the retroversion, a pessary may be inserted with the patient in the prone position. There is an advantage in re-examining the patient in the standing position, to make sure that the uterus has remained in place. The standing position was used in the days of Smellie (1697-1763) for examining pregnant women, but gave place to the prone positions which are more suitable for this purpose.

SUMMARY

1. Correction of retroversion is easier in the standing position than with the patient lying down, and in many instances obviates the embarrassing knee-chest position or manipulation under general anæsthesia.

2. This method is mechanically correct, and if it has been used before it has not received the consideration which it deserves.

3. This position is not recommended for routine use in pelvic examination, although even here it is sometimes of value.

REFERENCE

1. SMELLIE, (quoted by W. F. Mengert), *Ann. Med. Hist.*, 1932, 5: 453.

BENIGN LESIONS OF THE FEMALE BREAST SIMULATING CANCER.—M. Cutler describes several innocent states of the breast which simulate cancer and discusses the diagnosis and treatment of some borderline conditions, the exact nature and future course of which it is becoming increasingly difficult to estimate, as they are encountered in their earlier stages. The author believes that transillumination is a diagnostic aid in localizing duct papillomas in the breast. In some cases, however, the papillomas are so small that no shadow can be detected. This is especially true when the discharge is essentially serous. In older women, in whom a hæmorrhagic discharge from the nipple is more likely to be associated with duct carcinoma, or in whom a duct papilloma is more likely to be complicated by carcinoma, especially in the presence of suggestive nodularity in the breast, wide surgical excision or local mastectomy is the safest method to adopt. In younger women in whom the presence of carcinoma is less probable, and to whom the loss of the breast is of greater concern, the author does not adopt such radical measures. Still, he takes the view that to permit such a lesion to remain untreated is a dangerous attitude to assume. He treats younger women suffering from a serous or serohæmorrhagic discharge from the nipple, especially when localization of the lesion is impossible or uncertain, by means of interstitial irradiation. He concludes that this method should be even more efficacious in the treatment of duct papillomas or of early duct carcinomas. This method possesses the advantage of avoiding removal of the breast in young women, to many of whom the surgical procedure constitutes a considerable psychological shock.—*J. Am. M. Ass.*, 1933, **101**: 1217.

Editorial

TUBERCULOUS BACILLÆMIA

THAT tubercle bacilli enter the blood stream and are conveyed by this vehicle to other and more distant foci from the organ where they were originally located is a dictum well authenticated by pathological evidence. And this applies not only to frank cases of so-called miliary tuberculosis but to any case in which a metastasis occurs to a distant organ which is not accessible either by direct contact or direct lymphatic drainage. The conception has always been, however, that the tubercle bacilli do not multiply in the circulating blood, but are rapidly removed by one or other organ and are either killed or set up a new focus of infection at their new site of lodgment. Nevertheless, the student of tuberculosis was apt to think that the somewhat meagre percentages of positive results, by whatever method reported, *i.e.*, direct examination, culture or guinea-pig inoculation of whole or treated blood, was partly due to technical difficulties which would one day be obviated, with an ensuing rise in the percentage of demonstrable instances of tubercle bacilli in the circulating blood. It was therefore with decided enthusiasm and receptivity that one read the reports of Löwenstein[1] during the past years that he had been able to culture tubercle bacilli from the blood in a high percentage of cases of tuberculosis (39—100 per cent, depending on the group of cases studied). It should be remarked, however, that this enthusiasm was somewhat dulled by other reports that he was culturing tubercle bacilli from patients suffering from other diseases, notably rheumatic fever cases which one might justifiably call "controls." Löwenstein's work was commented on in this *Journal* some time ago, and it was then pointed out that his findings were still *sub judice* and would have to be corroborated by other and independent observers before they could be accepted unconditionally. This will be attempted here, and the stimulus for so doing is to be found in the recently published excellent and highly critical monograph on the subject of "Tuberculous Bacillæmia" by Prof. G. S. Wilson, of the London School of Tropical Medicine, appearing as a special report of the Medical Research Council.[2]

Wilson discusses and criticises the findings reported and possible errors likely to occur in:—(1) the microscopical; (2) the animal-inoculation; and (3) the cultural method of examination of the blood for tubercle bacilli. Under the latter heading he divides the results obtained—(*a*) previous to Löwenstein's work, (*b*) by Löwenstein and his pupils, and (*c*) subsequent to Löwenstein—and one may well follow this procedure.

Microscopical examination.—After abstracting the individual reports from 1884 to 1932, his discussion points out the following discrepancies. (1) Different workers, using the same technique, have obtained contradictory results; (2) there is no apparent relationship between the amount of blood used and the frequency with which positive results were found; (3) acid-fast bacilli were found by some workers in large numbers, while by others only after prolonged search; (4) there is no constant relationship between the type of tuberculous case studied and the percentage of positive findings; (5) the ability of tuberculin injections to produce a mobilization of tubercle bacilli in the blood is discordant; (6) there is no constant relationship between microscopical positive and positive animal-inoculation methods; and (7) acid-fast bacilli were found in the blood of non-tuberculous and apparently healthy people. It is this last observation which shows that there is ground for doubting the exactness of the microscopical technique as a means for demonstrating tuberculous bacillæmia. There are two possible sources of error; either the acid-fast bacilli seen are artefacts, or they are true acid-fast bacilli but not tubercle bacilli. Ignoring the commoner well recognized type of artefact, Wilson adduces

1. LÖWENSTEIN, *Münch. med. Wchnschr.*, 1931, **78**: 261; *ibid., Zentralbl. f. Bakteriol.*, 1932, **123**: 510.

2. WILSON, Special Report Series, No. 182, Medical Research Council, London H. M. Stationery Office, 1933.

evidence, largely from the work of Kahn and Rothacker, and Charon, that blood is particularly prone to show this type of artefact, since fibrin, the stroma of red blood cells, the granules of leucocytes, cholesterol, lecithin, and lipoid crystals may sometimes lead to misinterpretation. That the acid-fast bacilli may not be true tubercle bacilli is also possible, since Brem first, in 1909, found acid-fast bacilli in his reagents and traced it to the distilled water used in his laboratory. Wilson has had Mrs. Schwabacher show that in his laboratory scrapings from cold water taps not infrequently contain acid-fast bacilli. So the recognition of tubercle bacilli by microscopical methods is impossible.

Animal inoculation.—Here again the results cannot be accepted uncritically, and show great discrepancy, due to the different criteria used by different observers. Thus the diagnosing of tuberculosis in the absence of microscopical lesion, by the tuberculin reaction alone, or by finding acid-fast bacilli in the animal's blood, is not justifiable. Again spontaneous tuberculosis must be constantly guarded against. Wilson considers that genuine tubercle bacilli have been shown to be present in the blood stream of patients by the animal inoculation method in about 4.9 per cent of severe pulmonary tuberculosis, 36.4 per cent of miliary or meningeal tuberculosis, and in 2.7 per cent of non-pulmonary tuberculosis. These are the figures obtained by the method which he considers, in the hands of experienced workers, to be the most reliable.

Cultivation of tubercle bacilli from the blood of human beings previous to Löwenstein.—From 550 cases of tuberculosis usually severe pulmonary disease, tubercle bacilli have been cultured 6 times, or approximately in 1 per cent.

Cultivation of tubercle bacilli from blood by Löwenstein and his pupils and by subsequent observers using his technique.—It is difficult to arrive at an exact conclusion from the results in the former reports, since cases have been reported by Löwenstein and independently by his collaborators, the probability being that the same case is reported twice. Secondly, there is no warrant for the inclusion of "microscopically positive" cultures, *i.e.*, cultures which show no growth after 6 weeks, but scrapings from the surface of which show acid-fast bacilli. The sources of error have been pointed out under a previous section (Microscopical Examination). Thirdly, even a macroscopic growth of acid-fast bacilli is not *prima facie* evidence of tubercle bacilli, unless they are proved so with certainty. Schwabacher herself has isolated six acid-fast saprophytes by the cultural method. There is the same discrepancy in the positive results of Löwenstein (39 to 100 per cent) in different types of tuberculosis, and with subsequent observers (0 to 20 per cent), in fact almost the same discrepancies as were noted under the microscopic method. The cultural method in the hands of workers other than Löwenstein and his collaborators has yielded over 1 per cent in pulmonary, 6 per cent in miliary or meningeal, and in 0.1 per cent of non-pulmonary tuberculosis. These figures are considerably less than those previously quoted for the animal inoculation method (4.9 per cent, 36.4 per cent, and 2 per cent, respectively). In contrast to these low figures on the living, 51.5 per cent have been reported in post-mortem cases of fatal tuberculosis. One is therefore forced to the conclusion that Löwenstein's high percentage of positive cultures has not been confirmed, and that tuberculous bacillæmia is far less frequent than has been claimed by many workers.

ARNOLD BRANCH.

RECENT DEVELOPMENTS IN MEDICAL DIATHERMY

IN the *British Journal of Physical Medicine* of September, 1933,[1] a valuable and practical article by Erwin Schliephake, of Giessen, is to be found on the subject of short wave-length diathermy. New advances in this form of treatment are made possible because of the introduction of thermionic valves in diathermy apparatus, which permit the production of undamped waves of short wave-length, and some wonderful results are recorded.

In 1928, Nagelschmidt demonstrated a new short-wave diathermy apparatus which was characterized by certain distinctive

1. SCHLIEPHAKE, E., Ultra-short electric waves, *Brit. J. of Phys. Med.*, 1933, 8: 69.

features. In the first place the waves generated were only one-third the length of those delivered by older apparatus, and, secondly, insulated electrodes were used, thus permitting application over the patients' clothes. At that time Nagelschmidt claimed special virtue for the apparatus in that such conditions as pneumonia and pelvic and other infections were very favourably influenced by treatment with this type of energy. In Schliephake's fascinating article further development along this line is recorded and we learn that ultra-short diathermy waves, 5 metres and less in length, still better serve us in the conservative treatment of various types of infection.

In this new apparatus the ultra-short waves are produced by using an electric field oscillating between condenser plates in a closed circuit, and an electronic valve is employed. The frequency of the oscillations is very high. It is noted in this work that the various tissues of the body exhibit entirely different degrees of conductivity to these waves as compared with the classical diathermy current. It has also been found that these waves act in characteristic ways according to their length; many of the effects are apparently quite selective. In treatment, the patient or part treated is simply placed between the condenser plates.

A very wide range of application is described. It is of interest to find that in many conditions ordinary diathermy is definitely contra-indicated because of the presence of infection and pus. In about three hundred cases of furunculosis the average treatment period was 4 to 5 days. Large carbuncles healed in 10 to 20 days after eight to fifteen treatments. In every case a surgical operation was avoided. In most cases pain and tension was relieved after the first treatment. Extensive internal suppurations can be cured without operation. Empyema of the nasal cavity, even in chronic cases, is favourably influenced and heals in a few weeks. A wide field is opened in treating suppurating diseases of the lung, particularly abscesses, purulent pneumonias, gangrene, and empyema. All patients with pulmonary abscesses treated in this way have recovered. The treatment here lasted three to six weeks. In a case of post-pneumonic empyema complete resorption was effected in three to four weeks without puncturing or opening the pleural cavity. A striking feature is the rapid subsidence of fever. After three to five treatments the patients are usually apyretic. The general condition generally improves from the first. In nearly all cases the treatments induced sleep. Favourable results can similarly be reported in inflammatory affections of the adnexa and in pelvic peritonitis. After four to five treatments the patients were free from pain. In recent cases of osteomyelitis the trouble can frequently be cured. In chronic cases sequestration commenced, in treated cases, after 4 to 8 weeks in patients who had been in hospital for years without any change in their condition. In joint affections the best results were obtained in gonorrhœal arthritis. The joints became painless very soon, sometimes after the first treatment. All forms of exudative arthritis showed a favourable response. In rheumatoid arthritis success was not so general. This form of therapy also opens a new field for combating focal infections. Satisfactory results have obtained in some cases of myocarditis, nephritis, and angiospastic troubles.

While the whole field of indication for ultra-short wave-length therapy is by no means established, "there is no doubt about its efficacy in suppurating infections." This is due to the following factors:—attenuation of the germs, thermic effect and hyperæmia, favoured, apparently, by a lowered tonus of the sympathetic system, and, lastly, increased phagocytosis. Added to this there may be a selective action on germs or parts of organs, just as selective effects have definitely been proved in the chemical laboratory when various electrolytes are irradiated by varying wave lengths. This last suggestion remains to be proved.

We may agree with the Editor of the *Journal of Physical Medicine* when he writes,—"Thus it can be seen that Physical Medicine has achieved a further triumph and a new vista of healing has been opened up."

E. E. SHEPLEY.

Editorial Comments

The Health Survey of the City of Hamilton

The report of the Health Survey of the City of Hamilton, conducted by Dr. Grant Fleming and Miss Laura A. Gamble, during the summer of 1933, is before us and is a comprehensive and logically constructed document. While the Survey was in no sense an official activity of our Association, the fact that Doctor Fleming is one of our Associate Secretaries and a trusted exponent of certain of our health activities, and the additional fact that an authoritative statement on the health situation in any important community is of value to us all seem to warrant more than casual notice. It is noteworthy, too, that the findings of the report have called forth the endorsation of Dr. J. G. FitzGerald, also an eminent authority on public health matters, and the Chairman of the Association's Committee on Public Health.

The Survey defines Public Health as "the application of preventive medicine on an organized community basis, which has as its objectives the prevention of disease, the prolongation of human life, and the raising of the standards of physical and mental health, thus increasing efficiency, effectiveness and happiness." This conception gives the key-note to the whole report. Criticism is everywhere constructive. The report points out that the health program for the city had not been planned with definite objectives, with the result that it is unbalanced, the medical profession in general has not been brought into it, and there have been rivalry and duplication of effort, with resultant waste of time and money. In spite of all this, it is pleasing to learn that, so far as health conditions can be measured, the general health of the City of Hamilton is satisfactory, a condition of things that reflects credit on the health organizations and the authorities responsible for furnishing the money required for the maintenance of these health activities. Typhoid fever is unknown, diphtheria has been practically eliminated by a widespread application of preventive inoculation, and the tuberculosis death rate of 42.3 is the lowest for any city the size of Hamilton. The infant mortality rate is considered to be the most sensitive index we possess of existing health conditions. For Hamilton this is 55.6, a figure which the Survey thinks is relatively satisfactory. One is interested to see what will happen when the changes recommended have had time to be effective.

All the usual departments of health activity are dealt with in the report in a helpful way. Ideals are set forth, then the local situation, appraisal of the effort already made, comment, and recommendations. Thus, the Survey is a model of systematic and impartial investigation. While, of course, the report is specially applicable to the problems of the City of Hamilton the method by which the investigation was conducted should be of use to and have an appeal for all public bodies who are not satisfied with their local health conditions. The problems are always clearly stated and the remedies as clearly set forth. Those conducting the Survey and those assisting them deserve the thanks of all who are interested in public health work.

A.G.N.

Pierre Paul Emile Roux

A master in the scientific Israel was lost to the world when Emile Roux, one of the most distinguished of Pasteur's pupils, and the Director of the Pasteur Institute of Paris, passed away on November 3rd, 1933. Possessed of a clear, incisive and analytic mind, and endowed with indomitable energy, he was able, in spite of the fact that for some thirty years of his life he was handicapped by a chronic pulmonary disease, to carve out for himself a career of great distinction, one which entitles him, indeed, to rank as one of the great benefactors of the human race. He is sure of his niche in the Hall of Fame.

Pierre Paul Emile Roux was born in the province of Charente in 1853, the son of a schoolmaster, and there he spent the earlier years of his life. Coming to Paris when still young, he was admitted to Pasteur's laboratory in the Ecole Normale in 1878, and was also for some time a laboratory worker at the Hôtel-Dieu. Roux' name will always be associated with the development of certain phases of bacteriology, notably with toxins and antitoxins, and he may be regarded, with Pasteur, as a chief founder of the science of immunology. He investigated cholera, chicken-cholera, rabies, tuberculosis, and especially, diphtheria. Working at first with Yersin (1888-1889), he described a method of isolating the bacillus of diphtheria, noted that the toxin when not in sufficient amounts to prove lethal in experimental rabbits could yet cause paralysis; prepared the toxin in pure form by filtering cultures of the bacillus through a porcelain filter; noted that the injection of the toxin produced all the signs of diphtheria, save the membrane; and studied the conditions under which the toxin was produced. All this proved that the Klebs-Loeffler bacillus was the true cause of diphtheria. Later, Roux and Yersin worked out the identification of the bacillus as a means of diagnosis, on lines that are still being applied. Then came the crowning achievement, when, with Martin (1890), he was able to prepare, by the immunization of horses,

an effective antitoxin for the treatment of diphtheria.

Owing to the state of his health, Roux, in his later years, had to delegate much of his administrative duties to his assistants, and was unable to carry on personally the onerous details of research, yet he retained his freshness of mind and his interest in scientific and other problems, and was enabled, through his very disability, to take a wide view of these problems, to study them in their proper perspective. In matters of scientific medicine and public health Roux was at his death the outstanding figure in Paris, and, indeed, in all France. A.G.N.

Charles Albert Calmette

The Pasteur Institute of Paris has suffered a further loss in the death of its Assistant Director, Prof. Charles Albert Calmette, which occurred on October 29th, 1933.

Charles Albert, the youngest of three distinguished brothers, was born at Nice on July 12th, 1863. He began his medical career early, as a naval surgeon, but returned to France in 1890 and became a member of Pasteur's staff. He was the founder and first Director of the Pasteur Institute of Saigon, French Indo-China. Here he did his well-known work on snake venoms which led to a considerable reduction in the mortality from snake-bite. In 1895 he became the Director of a newly-established research institute at Lille, where he prosecuted a wide range of studies on bacteriology, parasitology, hygiene, veterinary medicine, agriculture and industry. Here it was where he became specially interested in tuberculosis, introducing the conjunctival test for the diagnosis of this disease, and studying the effect of changes in nutritional environment on the character of various strains of tubercle bacilli. Here, too, in association with Doctor Guérin, he began the series of cultures of a bovine strain of the tubercle bacillus, which eventually gave him the greatly attenuated form that he used as a protective vaccine. This became known, the world over, as BCG. For the remainder of his life he concentrated his whole effort, practically, on the study of tuberculosis and its prevention. When Metchnikoff died Calmette was invited, in 1917, to take his place at the Pasteur Institute of Paris, which he did, though not until the War was over. Owing to Roux' chronic ill-health, Calmette, nominally Assistant Director of the Institute, became virtually its Director. The BCG vaccine was first given to human beings by Drs. Weill-Hallé and Turpin a few years after the war, and since then controversy has raged on the question of its innocuousness. Generally speaking, the workers in the continent of Europe are satisfied that BCG is harmless and confers definite immunity. The conclusions of Calmette and his followers, have been challenged, however, in England, Canada, and the United States, partly on the ground that his statistical data are incomplete and inconclusive, and, partly, on the ground that the administration of a living organism to a human being is unjustifiable when we do not know its fate after introduction. Several workers in English-speaking countries found that virulent strains of the tubercle bacillus could be recovered from the supposedly harmless BCG. The transformation of an attenuated germ into a virulent one might, conceivably, take place in the human body as well as *in vitro*. It was contended that the attenuated bacillus might remain quiescent in the body for a time, giving rise to a temporary immunity, but later in life it might acquire virulence and set up active disease; sufficient time has not elapsed to decide this important question. Calmette always strenuously denied that his attenuated bacillus ever assumed virulent properties and attributed the contrary findings of his critics to the contamination of their cultures. This possibility they, in their turn, derided. The Lübeck catastrophe was a great grief to Calmette, but there, at least, his vaccine was vindicated. We notice, now that years have rolled on since BCG was first introduced, that some of those who at first were strenuously opposed to Calmette on this question are now disposed to admit that BCG, as they have it now, does not undergo virulent transformation. Apparently, with more prolonged passage, attenuation has become more complete. We may hope that scientific control of the method will not be allowed to lapse, now that its originator has gone. It is rather interesting, too, that only some two years ago Calmette had his attention directed anew to the subject of snake venoms, when certain investigators took up the study of the effects on malignant growths. Calmette is sure of a distinguished place among the scientific sons of the great Pasteur. A.G.N.

John Stewart

As we were going to press word came of the death of Dr. John Stewart, of Halifax, at the ripe old age of eighty-six. In spite of several serious attacks of illness and his advanced years he was able to be about until comparatively recently, though he had been in virtual retirement for some time. The fact that he was honoured by his Sovereign with the C.B.E. for his war services and by three universities with a Doctorate of Laws serves to indicate the calibre of the man. Not only did he enjoy to an extraordinary degree the confidence and esteem of his own community but his reputation had extended throughout the Dominion. With his passing the profession has lost a skilful practitioner, an upright Christian gentleman, and those who knew him best a sincere and trusty friend. A.G.N.

Retrospect

THE EXPERIMENTAL PRODUCTION OF OSTEITIS FIBROSA OSTEOPLASTICA

(VON RECKLINGHAUSEN'S DISEASE OF THE BONES)

BY J. FEIGENBAUM, M.D.,

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With the recent emphasis placed upon the laboratory branches of medicine, there has been much apprehension lest investigation and clinical medicine drift far apart. The view has been expressed that contributions to many of the biological sciences are largely of a theoretical nature, and that therefore much of the work will not be applied to the elucidation of the problems relating to disease. The work to be discussed here is a direct contradiction to such opinions. Moreover, the work represents the experimental production in an animal of a disease encountered in man — the culmination of a chain of fortuitous circumstances not often met with except in endocrinology. Thus, the picture of hyperfunction and complete cessation of function of the thyroid gland has been produced both in animals and in man. And most of the symptoms of hypofunction (diabetes mellitus) and hyperfunction (adenoma) of the pancreas have likewise been brought about in animals, in the first instance by pancreatectomy, and in the second by the injection of large doses of insulin. Tetany, produced by the ablation of the parathyroid glands, has been known to occur for as long as thyroidectomy has been performed, when the parathyroids were accidentally removed in this operation. And now, a well-recognized and somewhat puzzling syndome is artificially reproduced in animals by the injection of the secretion of the parathyroid glands.

As is well known, osteitis fibrosa osteoplastica is a chronic disease of the bone characterized by muscle pains, weakness, pathological fractures, hypercalcæmia and osteoporosis. Closely allied to it is the so-called giant-cell tumour of bone. Johnson has been able to show that the injection of Collip's parathormone produced the essentials of the clinical picture in man and in animals. In the first series of experiments[1] he was concerned with symptomatology and the calcium and phosphorus metabolism of chronic hyperparathyroidism. Johnson himself received a daily injection of 50 units of parathormone over a period of 15 days. Definite pains in the arms and legs developed, with bone and muscle tenderness and weakness. A study of the calcium and phosphorus of the blood and of the urine and fæces indicated a hypercalcæmia with hypophosphatæmia and a definite though slight excretion of both elements. In the second group of experiments[2] the author induced the picture of osteitis fibrosa by injecting 10 to 20 units of parathormone into rats for 20 days. Control litter mates were maintained for study. Changes in the bones were observed grossly and roentgenologically. After death of the animals, the bones were studied microscopically. In almost all the rats bowing of the fore-limbs was noted two weeks after the parathormone injections had been started. The x-ray changes consisted of a rarefaction in the long bones, the process starting usually at the head and later involving the shaft. Microscopic sections of the bones revealed resorption of both cortex and Haversian systems, the presence of numerous osteoclastic giant cells, and the replacement of the bone substance by fibrous tissue. These changes were strikingly similar to those seen in osteitis fibrosa in the human individual. Johnson was able to bring about all these changes in puppies[3] as well as in rats.

It had been observed by Erdheim and others that the parathyroid glands were commonly enlarged in cases of rickets and osteomalacia. Johnson[4] therefore set out to study the effects of vitamin D in the form of viosterol upon the lesions caused by long-continued injections of parathormone. He was thus able to prove rather definitely that osteitis fibrosa differed from rickets and osteomalacia, not only histologically, but in that the etiology of these diseases was likewise distinct.

It is noteworthy that osteitis fibrosa had been produced previously in the laboratory in dogs[5] and in guinea-pigs at the Hospital for Joint Diseases in New York by Jaffe, Bodansky, and Blair.[6] However, in the case of the guinea-pigs of these experiments the effect of the parathormone upon the bones may have been an acutely toxic one and not analogous to osteitis fibrosa, as only one single large dose of parathormone was employed. Also, the roentgenological changes superimposed upon the bones were not followed by these workers as they were by Johnson.

It is clear from these experiments that a disease regarded heretofore as incurable has been brought within the group of maladies for which a specific form of treatment is now available. For, if the diagnosis of von Recklinghausen's disease of the bone is made with certainty, then parathyroidectomy should constitute a positive cure.

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Special Articles

TENDENCIES IN HUMAN FERTILITY*

BY W. L. HUTTON, M.B.,

President, Eugenics Society of Canada, Brantford

Owing to the growth of the sanitary conscience and to the scientific discoveries in the realm of preventive medicine, the opening years of the nineteenth century witnessed a phenomenal increase in world population. The conquest of disease and the resulting decline in the death rate acted like the release of a brake upon the results of human fertility. World population doubled itself in the nineteenth century, and is now estimated at 1900 million people. Under such circumstances the voice of Malthus was heard, warning the nations that the arable land available for the production of food must ultimately lag behind the needs of a continuously expanding population.[1] For a few decades it looked as though the forebodings of Malthus might come true, and that western civilization might soon be face to face with the same problem of over-population which now confronts Japan, China and India. But forces were already at work to prevent such a catastrophe. The last half of the nineteenth century demonstrated beyond the shadow of a doubt that the birth rates in all countries under the influence of western civilization were entering upon a period of consistent decline. Some countries showed evidence of the decline before others. Norway, Sweden, and Denmark, show a regular decrease in the birth rate since 1855. France had passed the peak of its high birth-rate by 1865; England and Wales by 1880; Italy by 1885.[2] Between 1850-54 the birth rate in England and Wales averaged 33.84 births per 1,000 population. By the years 1925-27 this rate had fallen to 17.56. During the same period the birth-rate in France fell from 27.50 to 19.35. In Holland it fell from 36.16 to 24.35. In Italy from 38.81 (1863 and 1864) to 28.49. Germany's rate fell from 38.2 (1880-1890) to 18.6 (1928) and for the same period Belgium's rate fell from 30.0 to 18.3.[3] In Canada (excluding Quebec), our birth rate has fallen from 26.4 in 1921 to 20.9 in 1931.[4] Without exception *all* the nations whose habits and thoughts entitle them to be classed as part of western civilization show this phenomenon of a falling birth-rate, and resulting from this falling birth-rate we find more older people of a child-bearing age surviving than would be the case were the birth-rate stationary.

Ultimately of course the birth rate will cease to fall, but at what level no man can tell. When that day comes the true birth rate will appear, and undoubtedly it will be lower than the present apparent rate. Recently the German statistician, Dr. Frederick Burgdoerfer,[5] has attempted to free the present birth-rates of several countries from the disturbing factors caused by the swollen age distribution at the adult level. When so adjusted, it becomes apparent that England, Sweden, Switzerland, Germany, Norway, Denmark, and France have ceased to be nations with expanding populations, and are now failing to reproduce themselves. We may accept it as a fact, therefore, that the trend of the birth-rate is downwards in all countries under the influence of western civilization. This fact in itself may not be an evil.

It is only when we commence to ask questions regarding the manner in which this birth-rate is falling that we discover factors of supreme and immediate importance. An indication of the trend is shown by an investigation into the extent of childless marriages conducted by the Millbank Memorial Fund[6] in the United States. It was found that in certain city groups, 18 per cent of the wives of professional men were childless, 16 per cent of the wives of business men, 15 per cent of the wives of skilled workers and 14 per cent of the wives of unskilled workers. Among the rural groups 10 per cent of the wives of farm owners, and 7 per cent of the wives of farm labourers were without offspring. Surveys and investigations have proved conclusively that professional men have fewer children than skilled artisans. Skilled workers have fewer children than common labourers. Labourers have fewer children than the blind, the deaf and the feeble-minded.

What about conditions in Canada? Are we also troubled with this problem of the differential birth-rate? In order to answer these questions, certain investigations were undertaken with the co-operation of many workers, the results of which I shall now give. Green's "Who's Who in Canada, 1931", contains the names of 3,727 Canadians. Three thousand three hundred and forty-eight of these are married men (some of whom are, of course, infertile) and 379 bachelors. The mean age of the married men was 54 years. The mean age of the bachelors was 55 years. This group produced 4,105 living daughters and 4,005 living sons, or an average-sized family of 2.17 children. Of course married people have to produce for the bachelors if the race is to be maintained, but subtracting the bachelors listed in "Who's Who" from the married men, the average sized family still contains only 2.42 children. It is to be noted that Quebec with its highly fertile

* An address delivered before the Public School Section of the Ontario Educational Association in Toronto, April 20, 1933.

population is liberally represented in "Who's Who", one Quebecite having 14 sons and 8 daughters. Remove the influence of this highly fertile group and the remainder of "Who's Who" are undoubtedly committing race suicide. Knowing the general downward trend of the birth-rate, it is safe to predict that future editions of "Who's Who" will record families with yet fewer children. The "Who's Who" of future years will probably contain less than two living children, which of course is the minimum necessary to reproduce the parental generation in this particular group.

Various other cross-sections of Canadian life were then investigated and in connection with these further studies, it is necessary to bear in mind the dictum of the American statistician, Dr. Louis I. Dublin,[7] that 3.15 children for each fertile family are necessary to maintain the population on an even keel. The reason for this large number is that out of every 1,000 women of marriageable age only 654 become mothers. These 654 mothers must therefore produce 1,000 daughters or 1.53 daughters per mother. We know that for every 100 daughters born, 106 sons are born, and from these data it follows that 3.15 children per family is the minimum.

With the cooperation of Professor Roy Fraser of Mount Allison University, Sackville, N.B., a study was made of the fecundity of the families sending 201 students to this university. The mean age of the fathers was 54 years. The number of living children was 704, or an average of 3.5 children per family. With the cooperation of Dr. Madge Macklin, of the University of Western Ontario, London, Ontario, a study was made of the families sending 320 students to this university. The mean age of the fathers was 55 years. The number of living children was 1,094, or an average of 3.41 children per family. Dr. B. T. McGhie, the Director of Hospital Services for Ontario, studied the fertility rate of 1,000 patients of the Psychiatric Hospital, Toronto, and found the parents of these patients had an average-sized family of 3.42 children. With the co-operation of Dr. A. M. Overholt, a study was made of the fertility rate of the families sending pupils to the Brantford Collegiate Institute. It was found that the 1,284 students attending this institution came from 1,066 families, and that each family has on the average 3.7 living children. With the cooperation of Principal Fetterly, a study was made of the families sending a pupil to the School for the Deaf at Belleville. It was found that 352 pupils came from families which had on the average 4.37 living children. Dr. B. T. McGhie has kindly given me the results of an investigation into the fertility rate of the families which have provided the patients for the Mental Health Clinics which operated in the various cities throughout Ontario. This group is composed of individuals who have had difficulty in adjusting themselves to various situations in their environment, but the group is not a psychotic one. Nor is it predominantly a feeble-minded group. It may perhaps best be described as a social problem group. A study of 1,000 such families shows an average of 4.44 living children per family. With the cooperation of Principal Race a study was made of the families sending a pupil to the School for the Blind at Brantford. It was found that 115 pupils came from families which had on the average 5.1 living children. Dr. B. T. McGhie then had completed an investigation into the fertility of the families which contribute a patient to the Ontario Hospital for the Feeble-minded at Orillia. Altogether 500 families were studied. These families produced 4,353 living children or an average of 8.7 children per family. These results are conveniently expressed in the accompanying Table.

Group	*Size of group*	*Mean number of living children*	*Mean number of dead children*	*Mean total per family*	*Mean age of fathers*
Green's "Who's Who" 1931					
(including bachelors)	3,727	2.17			54
(minus bachelors) .	3,348	2.42			
Western University .	320	3.41			55
Psychiatric Hospital	1,000	3.42	0.79	4.21	
Mt. Allison University	201	3.5	0.47	3.90	54
Brantford Collegiate	1,066	3.7	0.37	4.00	
School for the Deaf, Belleville	352	4.37	0.26	4.60	
Mental Health Clinics	1,000	4.44	0.55	4.99	
School for the Blind, Brantford	115	5.1	0.72	5.80	
Ontario Hospital for Feeble-minded, Orillia	500	8.7	1.0	9.70	

From these various studies it is evident that the falling birth-rate is not operating equally among all classes of society. The birth-rate has fallen to the lowest level in those who have reached the highest social levels. It has generally been assumed that the families who contribute the patients to the Hospitals for the Insane reproduce their kind at a greater rate than the general population. This assumption receives no support from this particular study, as the size of the families in this group is the same as the size of the families in the group from which university students come, and is actually less than the size of the families in a typical industrial city. *On the other hand, the evidence is convincing that the group from which the feeble-minded spring is reproducing itself much faster than the general population.* Indeed this group is probably the only one in which the birth-rate is not falling.

What are the causes of these falling differen-

tial birth rates? We suspect that some of them are intimately connected with the vigorous campaign for birth-control which the Neo-Malthusian League started in 1890 A.D. The spread of such information throughout the world has had an undoubted tendency to lower the birth-rate, but it does not tell the whole story. How could it, when we find that the decline in the birth-rate in Norway and in France began years before modern preventive measures were known? In Holland, for instance, the decline in the birth-rate started twenty years before the world became acquainted with the term "birth-control." We suspect that the modern phenomenon which we know as the emancipation of women may be a factor in the declining birth rate. Motherhood is not the only career open to the modern woman, but the main effect of this emancipation has been to increase the age of wives which in turn has been responsible for part of the decline. Carr Saunders[8] has shown the effect of this movement has been to decrease the number of wives under 35 years af age, while the number of wives under 45 years of age remains practically the same.

It is apparent therefore that neither the spread of birth-control knowledge nor the emancipation of women offers us a complete explanation for the falling birth-rate. We must look deeper for the fundamental cause or causes. It is just 64 years ago that Sir Francis Galton, while investigating an isolated phenomenon, stumbled upon an adequate explanation for the reason why the families of great men who had been ennobled were apt to die out. Galton[9] found that a considerable proportion of the new peers and their sons married heiresses. They wanted an increase of possessions for the endowment of their younger children, and the heiress with the fortune wanted the title. Such marriages were found to be peculiarly unprolific. Eight peerages were actually extinguished through the influence of the heiresses, and others narrowly escaped the same fate. Galton found that 100 heiresses had 414 sons and daughters while 100 wives who were not heiresses had 620 sons and daughters. As a result of this study Galton wrote these memorable words, "I look upon the peerage as a disastrous institution owing to its destructive effects on our valuable races. The most highly gifted men are ennobled; their elder sons are tempted to marry heiresses, and the younger ones not to marry at all, for these have not enough fortune to support both a family and an aristocratical position. So the side-shoots of the genealogical tree are hacked off, and the leading shoot is blighted, and the breed is lost forever."

Recently Wagner-Manslau[10] has investigated the fertility of 4,622 German counts, as recorded in the Almanach de Gotha for the years 1832-1911. He found that those who married into the new nobility had 2.6 children while those who married into the wealthy middle class had 2.02 children. In another study which suggests an answer to the question "Can non-fertility be inherited?" he studied the marriages of 2,076 counts whose parents had had not more than two children. These marriages yielded 4,611 children or 2.22 children per marriage. He then studied the marriages of 1,993 counts whose parents had had not less than six children. These marriages yielded 5,219 children or 2.62 children per marriage.

From these various studies one may conclude that the profit motives which cause the English peerage and the German nobility to search for the maximum dowry are related to a tendency towards infertility, and towards the extinction of the breed from which they sprang. These forces have probably always been at work. They are inherent in human nature. The skilled artisan will appreciate the value of a modest dowry as readily as the Lord of the Manor whose purse is hardly long enough to meet the expense of maintaining his social position. It has probably always been true among men who have risen above their fellows that those with the fewest children have had a definite economic advantage over those with many children. But it has remained for modern civilization to place the widest premium upon childlessness. Take the case of the young working-man who seeks amusement and relaxation among his girl friends, and from among whom he will eventually choose a wife. It will more likely than not be among his friends who belong to small families that he will find that material prosperity and modest luxury which he will value highest. It is not only the higher strata of society which look with disdain on shabby clothes and a neglected outward appearance. It becomes easy for such a young man to select for his wife and the mother of his children, the daughter of a prosperous independent working man whose economic elevation may be due to his relative infertility. Multiply such an example a hundred thousand times and you finally reach a total result which must and will affect the birth-rate of an entire country. But some will say these forces have always been at work. The lower ranks of society have always provided the steady stream of those pushful, energetic, ambitious individuals who have forged their way to the top. And if in the process the selected ones destroy themselves, why should we be alarmed? Will not the circle of events but repeat itself? It is a comforting philosophy, but it disregards the fundamental changes in the lives of men which have followed in the wake of the Industrial Revolution and the great rural exodus.

Prior to the onset of the machine age the great mass of mankind lived the simple lives of peasants, uninfected with the modern urge for social advancement. The motives which influence the modern man to remain single on

into the twenties were almost entirely lacking. There was no sense in postponing a marriage in the hope that a man's circumstances might improve. The poor expected to remain poor. Moreover, a wife was an economic asset, a real help and a fellow-worker. Children also were more of an asset than a liability. They soon grew up and each one could help in the numerous tasks which composed the drudgery of existence. And when sickness and premature age clouded the picture as they always did, the man with many children counted himself as lucky. Through man's long history and up till the pre-industrial revolution period the forefathers of most of us were peasants who married young and raised large families. We know they were extremely fertile, for only a fertile people could survive the onslaughts of plague, famine and war which every generation suffered. Only a population in which the average family contained at least five and perhaps more children could have recovered from the ravages of the contagious diseases which swept ceaselessly through the ranks of humanity. And so we know the death rate was high, extremely high, and in the combination of a high birth rate and a high death rate we discern the pruning-hook of nature working its will through the forces of natural selection. Under such conditions of life the whole evolutionary progress of mankind had taken place for countless generations. Grave mental and physical defects were not encouraged to survive and pollute the blood stream of future generations. A ruthless and endless weeding-out of the unfit kept the race strong and virile. At least four-fifths of the people were peasants, and even as late as 1850 three-fourths of the population of France lived in communes with less than 2,000 of population. But the industrial revolution changed all that. The steady stream from country-side to city became a mighty torrent, and the end is not yet. During the last one hundred years one can discern an extraordinary movement among the masses of mankind, a movement slow at first, but gaining in momentum as the years flow by. We see streams of people deserting the country-side and flowing into the towns and cities. At first by the thousands, then by the tens of thousands, and now by the millions. The main motivation behind this rural exodus undoubtedly has been the hope of improving the economic outlook. And in the cities the most alert, the prudent, and the saving ones are selected for advancement, while many are selected and are successful because they are non-fertile. At the beginning of this great movement the position of the peasants who had now become labourers and town dwellers was not drastically different from the position of their peasant forbears. As yet there were no general laws against child labour, and children were still an asset. For the first half of the nineteenth century the birth-rate remained high. But the day has gone by when simple rustic folk make up the vast bulk of the population, and even though the march of events should reverse the present population movements, it might not change the mental outlook. There is no surety that a back-to-the-land movement would reverse the present trends in human fecundity. Men are not willing to return to the simple life. The fires of ambition have been too widely lit. The striving spirit has been unleashed. A vast proportion of men have dedicated their lives to the pursuit of personal gain. An atmosphere has been created which is fatal to the procreation of children. As Johannes Müller states "Common sense is the child's greatest enemy."

It is plain therefore that the tendency in human fecundity is towards the establishment of differential levels, and the level established for any given group will vary in inverse ratio to the striving spirit which permeates the group. This rule acts as if it had the force of a natural law. It explains the universal phenomenon that the well-to-do have few children and the poor have many. It explains the step-like gradations in the fecundity of the groups into which our social structure is divided. When considered conjointly with the forces set in motion by the industrial revolution and by the great rural exodus it offers us a reasonable explanation for the falling birth rates in all countries under the influence of western civilization. It explains the high fecundity of the feeble-minded and of those groups which for various reasons remain untouched by the modern urge for social and economic advancement. It explains the low fecundity of the group represented by the patients of the Psychiatric Hospital in Toronto. The striving spirit is not lacking in this group. Indeed, in so far as the insanities are an expression of the increased tempo of modern life, and in so far as mental breakdowns in normal people are a result of futile strivings for vain superiorities, this low fecundity follows the rule—the fewest children to those who strive the most.

This tendency in human fecundity does more than explain all these things. It presents us with this riddle—How can western civilization survive if the feeble-minded, the blind and the deaf are left to carry on the old racial traditions of large families, while the rest of us submit to a process of natural selection whereby the quality of non-fertility is continuously preferred to the quality of fertility? The importance of this process is indicated by the English statistician, Dr. R. A. Fisher,[11] who estimates that in that part of the English population with incomes of £300 a year or more the current supply of children is not sufficient to replace more than one-half of the parental generation.

We live in a sick civilization. Humanity, like Aladdin, has rubbed the magic lamp, and called into being strange and vast powers which

tower over him, and seem ever about to engulf him. Man invents the machine to relieve himself of arduous labour, and finds that the call of the machine has weaned him away from the land, and from the simplicity of rural life, and now he stands aghast in a land of plenty while the murmuring voices of countless idle workers protest that the clothes of their children are worn and frayed, and that they have needs which cannot be filled.

A new philosophy of life is needed, for the old has failed us. The very fate of this civilization hangs upon our ability to find ways and means of encouraging people of sound stock to multiply and replenish the land. As for the feeble-minded and their progeny, society for its own protection cannot permit their present unrestrained rate of reproduction. It is our elemental duty to preserve the purity of the human blood stream, and how can we do this if we permit its dilution and pollution with the blood of the feeble-minded and the sufferers from the hereditary diseases? Only action by the State can control the multiplication of these human misfits, and it is for this reason we find a rising tide of public opinion in favour of legislation which will permit the sterilization of those who may be the parents of such defectives. The thinking people of this country should rally behind the clarion call of His Honour, Dr. Herbert Bruce, the Lieutenant-Governor of this province, who has recently and publicly urged the necessity of the state controlling the propagation of the unfit. Let us hope the necessary action by the State will not be too long delayed. Certain it is, if the present processes are allowed to go on for a few more generations, it will not be the meek who will inherit the earth but the feeble-minded.

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Medical Economics

THE MEDICAL TREATMENT OF THE INDIGENT IN BRITISH COLUMBIA

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THE SITUATION

The problems caused by the depression as it affects this province are probably different only in degree from those faced by the profession in the other provinces of Canada. The more or less sudden and complete stoppage of income in some twenty thousand families has led to a situation where any medical relief afforded to the members of these families must be afforded on a basis of charity. The State has recognized its duty to feed and house these victims of social dysfunction; it has not yet accepted with any grace the idea that it has any responsibility towards them when they are sick. This is no new thing; the State has for many years refused to include in its allowances for old-age pensioners,, receivers of Mothers' Pensions, etc., any sum for medical care *by physicians*. This does not mean, of course, that the State refuses to afford hospital care when necessary and nursing; but it fights vigorously against any suggestion that care by a physician should also be provided at the expense of the taxpayer. Only when forced to provide it, will it do so, and any payments it makes are on a minimum scale. When we speak of the State, in this regard, we imply the larger organisms of the Province or Dominion.

The indigent of the community may be divided into those receiving relief, *viz.*, the twenty or more thousand families referred to, and those who are still working, but, with the greatly reduced incomes now in vogue are quite unable to budget for medical care. For the former some relief is obtainable from the State; for the latter, none.

The province is divided into "organized" and "unorganized" districts, the former including the larger cities, *e.g.*, Vancouver, Victoria, New Westminster, Nanaimo, etc. Small villages and towns, rural districts, logging and mining areas, come under the latter term. In the organized districts, Dominion and Province assume no responsibility for people who are resident there, for the unorganized districts and for the transients of no fixed abode, who are caught in the cities, some degree of medical care is provided. Any medical care provided by the authorities, it must be stated, applies only to those "on relief", not to the other equally needy people referred to.

In the unorganized districts there are two ways, roughly, in which provision is made for medical care. Local doctors are used to some extent, and a certain amount is paid for their work. On the whole, perhaps, this is not ungenerous, in view of the undoubted scarcity of funds. The second method is where the indigent are collected in relief camps, for reasons of ad-

ministrative economy, and here medical men are employed on a salary. The salary is quite inadequate as a rule, and is the smallest that will be accepted, but at least it keeps some medical men alive.

But in the cities or organized districts, conditions are entirely different, and it must be remembered that a good deal more than half the population of British Columbia is in these districts and the greatest amount of indigence is here, too, since the cessation of manufacturing, fishing, and of industry, generally, is felt most in the cities. Here the entire burden of medical care is thrown on the city or municipality, with the exception of the allowance always made by the Province for hospital care. The municipalities are frankly up against it; they cannot get the money. Taxes are desperately hard to get, and so much is ear-marked for relief that there is no money for road or street work, and so unemployment increases further—a vicious circle is formed. And, of course, there is no money for medical care.

The medical man, especially when he lives in the suburbs, is at a terrible pass. His income has gone to vanishing-point, because the people in his district are mainly out of work and on relief. But they used to be his patients and still call him in. He has to use his car and his time and his supplies, with no chance or hope of payment, and if hospital care is needed he loses the patient altogether, since our hospital authorities insist on such a patient going under the staff. The result is an enormous increase in unpaid hospital bills, and the hospitals are crying for relief. The staffs have reached the breaking-point and are beginning to rebel and refuse to carry on.

The city has provided two medical men to carry on work among the indigent. Needless to say, they cannot begin to handle even the emergency work. No provision is made for night work, and the city has simply left it to the private practitioner to carry on without pay.

This briefly is the situation that exists and that needs remedy. It is probably descriptive of the conditions everywhere in Canada.

WHAT THE MEDICAL PROFESSION HAS DONE

For nearly a year, we have, in Vancouver and in Victoria, been endeavouring to make arrangements with the city whereby the medical man might receive some return, even if a most inadequate one, for his work. As things are at present the medical man is a taxpayer, and pays his full share of the taxes out of which come relief funds. On top of this, he is expected to carry *the whole load of medical care,* except for two scandalously underpaid medical men on relief work. He has to pay for his own car expenses, office rent, dressings, etc., as well as give his time free. We have pointed out the rank injustice of this. We have suggested that the money now spent, or rather wasted, on outdoor medical relief, be divided so far as it will go on any basis which will ensure protection of city funds, amongst the medical men outside, who will do the work in their offices.

We have met with the greatest courtesy and indeed sympathy from city officials. But *they have not the money,* they tell us, and they cannot get the Province or Dominion to help. So we have not yet succeeded in securing pay for our members, except in the matter of maternity cases. Here, where the doctor will and can confine a relief case at home, the money which would otherwise have gone to the hospital for two weeks' stay for mother and baby is paid to the doctor and nurse, so that the former gets about $20.00, while the V.O.N. gets $10.00. This is really quite a fair fee, as things go.

In Victoria, the maternity fee does not yet obtain, but the physician is asked to send in bills for his relief cases at ordinary rates, and up to not more than $10.00 a month the city will pay them. The relief problem is not so acute, on the whole, in Victoria.

In North Vancouver, where there are very few medical men, and no hospital outdoor, conditions are somewhat better for the doctors. Here their bills are paid up to a reasonable amount, on the ordinary scale of fees.

In speaking of maternity cases, it is well to point out how quickly the habit of accepting charity grows in a community. Many of the relief cases refuse to be confined at home; they have a much better time in the hospital and a "specialist" to look after them. They have a holiday, good food, nursing, clean linen, and peace, and one can hardly blame them when one thinks of their ordinary conditions of living.

Another thing must be said to the credit of relief. Undernourishment and its consequences are not present to the degree that one might have expected amongst the families on relief. Their food is plain and wholesome, and the evils that some of us feared have not yet materialized.

There is a very strong feeling of resentment in the minds of medical men against the "professional fee" imposed on doctors by municipalities. This varies in amount in different municipalities, but to all of us it comes as an outrage. Not only are we paying other taxes, and bearing the cost of medical care of the indigent without any compensation, but we are further taxed an amount for which no return is given in any form. It is an iniquitous tax, and cannot, we think, be defended.

During the summer the profession in Vancouver decided, as from August 1st, to discontinue the care of relief cases in the Outdoor Department of the Vancouver General Hospital and elsewhere except in three cases:— (1) absolute emergencies where life is in danger; (2) where the patient has been an old family

patient of the doctor in question, and he feels, for compassionate reasons, that he has to respond to the call; (3) where patients are sent to the Outdoor Department by a private physician for x-ray and other special examination. In this case, the outdoor staff will act. Every physician in the city signed an undertaking to act accordingly. A letter to this effect was also sent to the City Council. It is altogether probable that in the near future an even more drastic move will be made by the profession, which is considering whether it should entirely refuse to do even hospital or staff work for the indigent on relief. Such a move as this would undoubtedly bring matters to a head, but, it is hoped that it will not be necessary.

THE REMEDY

Some years ago, when employment was the normal and unemployment the abnormal, state health insurance was being carefully considered as a solution for the problems surrounding the question of medical care. A new condition exists, and it is very doubtful whether a contributory plan of health insurance is immediately feasible, or whether, if put into effect, it would meet the need existing.

We are not yet ready with any definite scheme in British Columbia, but the new Government has definitely committed itself to health insurance as a policy, and the new Minister of Education and Public Health, Prof. G. M. Weir, is particularly interested in this matter. It is altogether probable that within the next year or two some scheme will be devised *and put into effect*, dealing with this whole question of medical care in a comprehensive way. As anything materializes in this regard, we will keep the *Journal au fait* with developments.

THE FINANCIAL ASPECTS OF STATE HEALTH INSURANCE FOR ALBERTA

BY G. E. LEARMONTH,

Calgary

Suggestions regarding possible systems of state health insurance have been made by the Commission appointed by the Legislature of Alberta to study the question. One provides for all the people of the province, at a cost of $11,000,000 or $13.75 per capita per year, and the other for working people only, at an annual cost of $1,900,000 or $13.17 per capita.

The first plan includes all the people of Alberta, 731,605, at an average morbidity of 7.35, or 5,377,296 days. At this latter figure the cost for hospitals is 66.83 cents or total of $3,593,647, or $4.91 per capita; 59.01 cents for drugs, $729,699, $0.99; 27.88 cents for dentists, $1,499,190, $2.05; total of $8,995,678, or $12.29 per capita.

Ten per cent, or $899,567, is allowed for administration and 2 per cent, or $179,913, for contingency reserve, or a total of $1,079,480, or $1.45 for these two items; making a grand total of $10,075,158, or $13.75 per capita, per year, or $1.15 per head per month.

On the basis of an employe paying five-ninths of the cost, this would amount to 64 cents per month, while an individual not an employe would pay seven-ninths, or 90 cents per month. The average number of dependent on one wage-earner's income is 2.4, but under present conditions it is estimated at from four to five dependents. The commission takes three as a fair average, so that an employe would pay three times 64 cents, or $1.92, and an individual not an employe three times 90 cents, or $2.70.

The second plan benefits only employes. The figures are based on that of June, 1931, when there were 142,090 wage earners in Alberta. This figure, at the average morbidity rate of 7.05 per capita, the average applying to ages from 15 to 69, would give 1,001,734 days.

Under this plan the costs would be: 1,001,734 days at 66.83 cents for hospitals, total of $669,458, or $4.70 per capita; 59.01 cents for doctors, $591,123, $4.16; 13.57 cents for drugs, $135,935, $0.95; 27.88 cents for dentists, $279,-283, $1.96; total of $1,675,799, or $11.77. Administration charges would be $167,580 and 2 per cent for contingency reserve $33,516, or a total of $201,096, or $1.40, making a grand total of $1,876,895, or $13.17 per capita.

The cost distribution of this would be: State, paying two-ninths, hospitals $148,768, doctors $131,361, drugs $30,208, dentists $62,062, total of $372,399. Employer, paying two-ninths, hospitals $148,768, doctors $131,361, drugs $30,208, dentists $62,062, total $372,399. Employe, paying five-ninths, hospitals $371,921, doctors $328,402, drugs $75,520, dentists $155,-160, total $931,003. Cost to employe would be: Hospitals $2.61, doctors $2.31, drugs 53 cents, dentists $1.09, total $6.54, or 55 cents a month.

The Commission says the province would be relieved of the 50 per cent patient day hospital grant in the case of each insured employe, as provision has been made in the estimate for total hospital costs. Ten per cent of the population are in hospital for 12 days, on the average. The Government grant for this group would be $85,000.

HEALTH INSURANCE

BY G. E. LEARMONTH,

Calgary

The College of Physicians and Surgeons in Alberta has been taking a plebiscite of the profession on the question of health insurance, as it is expected that during the coming session of

the legislature this subject will be brought forward, with the avowed intention, of placing every physician in this province under the jurisdiction of the Provincial Government. The following are some of the questions which have been asked:—

"Is the present system of practising medicine satisfactory: (a) to the patient? (b) to the physician?"

"Is an adequate medical service now available to all of the people?"

"Are the conditions of practice now satisfactory to the medical men: (a) financially? (b) do your patients consult you early enough? (c) could you do better work for your patients if they were not afraid of the expense?"

"If a mutually satisfactory system of health insurance was devised would you be in favour of it? If not, and if you are not satisfied with the present system, what would you suggest?"

"If a satisfactory system of state health insurance was set up: (a) should it be province wide and compulsory, that is, should it include all from the wealthy to the indigent class, inclusive? or only those in receipt of less than a stated annual income? (b) should the scheme include cash compensation for loss of time to the insured? (c) should the authority for control and the responsibility for payments to the profession be vested in a central board or handled by local boards in local areas?"

"Payment for services: do you favour the perpetuation of the principle of competitive practice, or the individual's right of choice of a doctor and the family physician type of practice, with provision for the reference of certain cases for consultation and specialized services; if so, in your opinion can these principles best be maintained by the "service-rendered" system of payment, that is a system whereby the doctor presents his accounts on an agreed schedule basis to a central board for payment? or would you favour a panel system, whereby individuals select the physician of their choice and register themselves and their families, under a physician's panel, with provision for changing from one panel to another, under certain circumstances? or would you favour a straight "state medicine" type of service, with all medical services provided and paid for directly under control of the State, the profession giving their services on a salary basis?"

"Should a local Board or a Central Board, or anyone else, have anything to say as to where any doctor under the scheme should be located or as to who should practise in any given locality?"

"Should doctors be allowed to pursue independent practice?"

"If physicians were placed on an adequate salary (a) would the high standard of work maintained by most doctors be maintained? (b) would it be more satisfactory to the physician? (a) is there danger of competitive bidding by physicians for salary contract? (d) what provisions would be made for permanent records of cases that would be available in case there was a change in resident physicians? (e) is there a possibility that the practice of medicine and care of the sick would become hampered by bureaucratic control?"

While the results are not finally known it would appear that from experience most men are convinced that anything which would interfere with the relationship that exists between the profession and the patient should not be disturbed, nor should the patient be hampered in his choice of physician where a choice is available.

To create a civil service for the medical profession, with a definite fixed salary, tends to minimize the desire of the members to do their best, as of necessity promotions would not be rapid and salaries could not be made to vary in towns of similar population, regardless of the effort put forth by an individual physician. The majority of physicians, according to the answers, prefer remuneration fixed on the service-rendered basis, because the greater the efficiency, the greater the remuneration, because the greater the practice. The replies show that emphasis is placed upon this, that, whatever changed condition follows, there should be no compensation for loss of time through illness of the patient, as malingerers might find it profitable to feign illness, which would make the financial burden unbearable to the province.

Though the present system is falling down at the present time, since patients are not attempting to pay their physicians in many cases, yet this is ascribed to the general depression and the further fact that though the province has placed the burden on the municipalities to care for their indigents, there is no real attempt to carry out the letter or the spirit of the Act. The Government will not force them to do so, and most of them will not pay without being forced. It is not felt that the present system is at fault or would be found to be so, were financial conditions at all like they were a few years ago. On the other hand, a feeling is expressed in the answers that some system should be devised which would induce the improvident to save systematically, and thus they would not be charges on the community in times such as these. This might be done by a compulsory deduction from their wages or other earnings, and thus some type of insurance might be provided for them.

If any scheme is adopted, the physicians think there should be one central Board of Control and not a local committee or a panel system, but perhaps a card system, whereby

any patient could go to the doctor of his choice, obtain the necessary service and the Central Board be called on to pay the physician at a rate agreed upon between the Provincial Government and the physician.

THE APPROACH OF SOCIALIZED MEDICINE

The following extract from the editorial pages of the *Bulletin of the Vancouver Medical Association* for October, is worthy of more than provincial notice. We would only add that the comments made in this editorial contain the courageous and fairminded reasoning that has always characterized our brother editor's writing.

"We publish in this number certain correspondence* between Dr. Routley and the British Columbia Medical Association relative to an interview held with Mr. R. B. Bennett, Prime Minister of Canada. Our readers will, no doubt, form their own conclusions on this matter. We feel that an advance has been made, in that Mr. Bennett has at least admitted the justice of our cause, but the extent of the advance reminds one of the bulletins which appeared daily from the battle front during the Great War, when "important gains" were announced. The actual results always seemed rather an anti-climax. And so it is with this. Our cause is just, but it is a case, apparently, where virtue is its own reward, and that is expected to be sufficient.

Dr. Routley appears somewhat more optimistic than we can at present justify his being. Nowhere does Mr. Bennett actually commit himself. He passes the buck back to the provinces. These are absolutely (at least in the case of the Western provinces) on their uppers, and will not contribute anything that they are not forced to give. So the prospect is not any too bright, unless we can find some other solution.

What are we to do in this emergency? Are we to be forced into the position where we must simply refuse to go on treating these unfortunate people? Suppose we did so refuse. That would, perhaps, force the issue, and might perhaps raise enough of a row to induce the authorities to find some money somewhere. It is a possibility, and we may yet be forced to it, if conditions persist as they are, or grow worse. But it will not be a solution. Even if some immediate financial result were obtained, it would not be a solution, it would leave much bitterness, and, like all wars, this conflict would leave a great many sore wounds in its train. Moreover, it would have another prejudicial consequence, it would establish standards of remuneration on entirely false bases, and these standards would undoubtedly be used to our disadvantage in future negotiations. Would it not be wiser to put the question to ourselves, whether the time is not now ripe for us to formulate an adequate and comprehensive scheme of medical care for the community, a scheme which would be not only fair to ourselves, but generous and profitable to the whole population? Expediency is never a safe guide, it is always accompanied by shadows of retribution. Consider the British Health Insurance Act, which took the easiest and opportunist course, instead of being designed on sound economic lines; during its operation vested interests have grown up and become entrenched, which make improvement well nigh impossible.

For good or evil the feet of our civilization are set on the path that leads to socialization of every department of life. For ourselves, we are frank to say that we think it is for good. But we must not halt and linger on the way, looking continually over our shoulders, in fear that we may have made a mistake. The words of Jesus, the Son of Sirach, the Preacher of Wisdom, are still true, and may well serve as our guide,

'Do nothing without counsel
And when thou hast once done, repent not.'

What scheme then should we urge? Health Insurance? Of late, a grave doubt has been growing in some of our minds whether even this would go far enough, or would solve all the difficulties. Also, we may question whether it is a sufficiently generous plan, whether, perhaps, we have gone far enough in considering the needs of the public, or whether we have thought too much of safeguarding our own rights. We do not imply that the latter is not fair and desirable, but we would emphasize the fact that our interests and those of the public we serve are inseparable and that candor and generosity on our part will do more than anything else to restore the medical profession to the pinnacle on which it once stood, and from which to a great extent, as a profession, it has slipped."

During his recent visit to Western Canada, the Prime Minister, the Rt. Hon. R. B. Bennett, had a conference in Regina with three of the western premiers during which the question of medical relief was discussed. He expressed sympathy with the difficulties experienced by the three prairie provinces over the question of medical treatment and hospitalization of persons on relief. The western premiers had suggested that the *pro rata* arrangement with provincial and federal governments and municipalities, each paying one-third of the cost of medical treatment as has been done in the matter of ordinary relief, should be carried out. Mr. Bennett was emphatic in his statement to the premiers that this was solely the duty of the province and the municipalities and that the Federal Government could do nothing. He promised to write, clearly setting out the position of the Dominion Govern.nent on his return to Ottawa, and so the physicians of Western Canada are left to carry on as best they can.

The following is a copy of the letter sent by the Right Hon. R. B. Bennett to the premiers of the various provinces of Canada, implementing his promise to the delegation of the Canadian Medical Association which waited on him on October 6, 1933. This marks one step further in the clarifying of a situation that has not been generally understood.

Ottawa, December 12, 1933.

Dear Premier,

A delegation representing the Canadian Medical Association met me some weeks ago and urged the desirability of the Federal Government providing a portion of the cost of medical aid for those receiving relief in the various provinces.

It was pointed out to me that many of the provinces had expressed their willingness to provide

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* This was also published in our own *Journal*, 1933, 29: 554.—[ED.]

for medical services for those on relief, but they alleged that the Dominion Government prevented them from doing so.

It is rather difficult to understand such a statement being made. The responsibility of the provinces in caring for the sick, by methods which they have themselves determined, cannot be made a Federal obligation. We have contributed to relief, but we have not set up a Federal Relief Commission as some of the provinces are unwilling to surrender their constitutional rights in that regard.

I pointed out to the delegation that I assumed the provinces would continue to discharge their obligations to their citizens, but if, from time to time, representations were made in respect to individual communities where it was found that the burden was unduly onerous, the Federal Government would sympathetically consider each case upon its merits and determine whether or not, on the facts stated, it would be warranted in making a contribution to assist the provinces to discharge their normal responsibilities regarding medical and hospital care and treatment.

I intimated to the delegation that I would communicate with each of the provinces in the sense above indicated.

Yours faithfully,
(Signed) R. B. BENNETT.

Notes on the British Pharmacopœia and Canadian Formulary

Note on the Preparations of Sodium Salicylate, C.F.

It is generally believed by physicians that when large doses of sodium salicylate are given the probability of gastric upset can be prevented by giving approximately equal amounts of sodium bicarbonate. This suggests that the gastric irritation is due to the hydrochloric acid of the juice freeing salicylic acid. If this be the explanation, other gastric antacids should be equally effective. The administration of large doses of these drugs as powders is also apt to cause gastric irritation. If sodium salicylate and bicarbonate are given in solution, the mixture gradually acquires an increasing purplish hue. The exact cause of this discoloration is disputed, but Mr. G. Bales has shown that only very minute amounts of the salicylate are changed, even at the end of months, and consequently no danger is introduced. However, patients frequently remember that the last dose from a bottle was coloured, while a new bottle is not. This discoloration is much more marked with sodium bicarbonate than with other antacids, such as calcium carbonate, and can be largely, if not completely, prevented by a trace of sodium thiosulphate. If the mixture be dark in colour when prepared the change of colour is not so obvious. Consequently the Editors of the C.F. present two dark-coloured mixtures, one containing salicylate and bicarbonate flavoured with liquorice syrup (Mistura Salicylica, C.F.) and the other, salicylate, calcium carbonate, and thiosulphate, flavoured with the Compound Syrup of Sassafras (Mistura Sodii Salicylatis et Calcii Carbonatis, C.F.). These may be recommended for their flavour, but should not be kept indefinitely.

The Editors also present a palatable preparation of Sodium Salicylate with Colchicum (Mistura Salicylica cum Colchico, C.F.).

Notes on Some Canadian Formulary Preparations

The attention of physicians and hospitals is called to a number of Canadian Formulary preparations which will be discussed here.

Collodium Acidi Salicylici, C.F., is an excellent preparation for softening or removing corns or callous skin. It has the advantage of making a tenacious coating over the area to which it is applied; it also does not so readily evaporate when the bottle is unstoppered, and therefore remains a useful preparation for a longer time.

The Elixir Bromidi Triplex, C.F. and Elixir Potassii Bromidi, C.F., contain 80 grains of bromide to the fluid ounce. The Triple Elixir is coloured red to distinguish it from the Elixir of Potassium Bromide. Both are very palatable and contain no sugar, so they may be prescribed for diabetics. These two preparations, which were submitted by the Canadian Pharmaceutical Manufacturers' Association, are now standard. Consequently, the physician and pharmacist should find that manufactured preparations bearing these names should be uniform in colour, flavour and composition, whereas previously they varied in all these respects. The physician will be well advised to use these standard preparations rather than proprietary bromide preparations.

Glycerin of Ichthammol, C.F., is a preparation which dermatologists might employ with advantage. The jelly spreads very easily, does not hold so tenaciously to the skin as the ichthammol itself, and can more readily be washed off with water. The therapeutic action of the ichthammol is in no way interfered with by the starch, water and glycerin. Ichthammol is the name used in the B.P., 1932, for what is commonly known as ichthyol.

Two preparations, Liquor Potassii Iodidi Saturatus, C.F. and Mistura Sodii Iodidi Saturata, C.F., should be very useful. The sodium salt is more palatable than the potassium. Each preparations contains 480 grains of the iodide in 480 minims of fluid, *i.e.*, 1 minim contains 1 grain of iodide. The physician is enabled, therefore, to prescribe quite accurately in minim doses any definite quantity of the iodides. For the quantity of total iodine, the physician is advised to consult the C.F.

Lotio Benzoini Composita, C.F., is a lotion designed for such conditions as chapped hands,

red or rough skin or sunburn. It contains sufficient alcohol to make it dry readily. A few drops of oil of lavender or rose may be added to give it an agreeable odour if the patient does not like the odour of benzoin.

Mistura Hexaminæ et Ammonii Chloridi, C.F., is very useful to increase the acidity of the urine, and at the same time to administer hexamine for its urinary disinfectant action. Owing to the irritant action of ammonium chloride, this preparation should be well diluted and taken after meals. It is difficult to mask the salty taste of such a large dose of ammonium chloride, hence the use of liquorice as a flavour. For patients who do not like liquorice, the Compound Syrup of Sassafras may be much more palatable.

When a simple dusting powder is required, the physician will find Pulvis Conspersus, C.F., a preparation worth consideration. It contains all the elements necessary, it can be cheaply made, and is free from the strong perfumes which contaminate so many toilet powders.

Two very pleasant and useful mouth washes have been prepared—the Collutorium Aromaticum which replaces the Liquor Antisepticus of the C.F., 1915, and Collutorium Aromaticum Alkalinum replacing the Liquor Antisepticus Alkalinus C.F., 1915. These are not so expensive as the various proprietary articles, and are highly recommended to the physician who wishes to prescribe for his patients something other than proprietaries.

In these days when cod-liver oil is a by-word in every household where there are children or adults who believe that cod-liver oil increases their resistance to infections, a palatable mixture of cod-liver oil which a physician may prescribe is a god-send. Such a mixture may be found in the Reference Companion as Emulsion of Cod-Liver Oil and Egg. This preparation should be tried when the patients complain of the oily-fishy taste of cod-liver oil and of the repeating of the oil for hours after the meal. A minim or so of oil of peppermint in 16 fl. oz. gives the emulsion a very agreeable taste for those who like peppermint. Others flavours are indicated in the C.F. It also contains a higher per cent of cod-liver oil than most emulsions on the market. The B.P. Extract of Malt with Cod-Liver Oil contains, like many of the commercial malt emulsions, only 10 per cent of oil and is unduly expensive as regards its oil content.

V.E.H. AND G.H.W.L.

Men and Books

MEDICAL ETHICS*

BY S. HANDFORD MCKEE, M.D.,

Montreal

"A wise nation preserves its records, gathers up its muniments, decorates the tombs of the illustrious dead, repairs its great structures, and fosters national pride and love of country by perpetual references to the sacrifices and glories of the past." With these thoughts in mind I have looked through some of the early records of our Society.

In January, 1896, Dr. Hal Foster, of Kansas City, Missouri, sent 100 letters to men in the western, middle western, and southern parts of the United States inviting them to meet in Kansas City on April 9th for the purpose of organizing a special Society. As a result of these letters about thirty representative men of these sections met at the Midland Hotel in Kansas City. The meeting was called to order by Dr. J. H. Thompson, president of the Kansas City Academy of Medicine, and an address of welcome was delivered by Dr. C. Lester Hall, president of the Missouri State Medical Society. Adolf Alt was elected chairman, and Hal Foster, secretary. The program for the first meeting was a long one, there being twenty-nine papers. On the day following, April 10th, a regular business meeting was held and the Society was organized. Adolf Alt was elected president, W. C. Pipino, first vice-president; W. L. Dayton, treasurer, and Hal Foster, secretary. After a great deal of discussion, the Society was christened "The Western Ophthalmological, Otological, Laryngological and Rhinological Association."

[Dr. McKee then quoted details of the succeeding annual meetings, which can be obtained in his original address in *Trans. of Am. Acad. of Oph. & Otolaryng.*, 1932]. He then continued.

The present position of the Academy at this our thirty-seventh annual meeting is as follows: Our membership is about 2,025. During the last year we have spent as follows: Research, $4,500.00; Trachoma, $250.00; Physiological Optics, $250.00; Army Medical Museum, Washington, $500.00. Our total assets are in the neighbourhood of $100,000.00. It may well be said of the Academy, "Achievement is but another milestone along the pathway of progress—the end of the journey lies ever beyond." The most casual observer will see from these figures that our growth has been really phenomenal and, in considering Academy affairs during the last few years, I have often wondered whether we are not moving forward a little too quickly, and whether the time has not now arrived when we might justly take stock of our surroundings,

* The Presidential Address (in abstract) delivered at Montreal to the American Academy of Ophthalmology and Oto-laryngology, 1932.

rest a little in our uplifting and consolidate our position before again moving forward, taking time to turn our minds toward the less material side of our professional work.

The first code of medical ethics that we know of for the government of medical practice was that of Hammurabi, dated 2250 B.C. The monument on which it is recorded was discovered in 1901 on the Acropolis of Susa. Hammurabi was the sixth king of the first dynasty of Babylon, and the obverse of the monument shows the king received the laws from the Sun God. This code and the Smith papyrus found in Egypt give us our earliest knowledge of conditions in the medical profession. We learn that even in the earliest times physicians' charges were controlled; carelessness in practice was punished by law, and warnings were issued against poor judgment and rash surgical intervention.

A second landmark, set up about 1,800 years later, is to be found in the work of Hippocrates, the great Greek physician of Cos. These Hippocratic writings, as we might have expected of one who was a contemporary of Pericles, Socrates, and Plato, reveal a high conception of professional responsibility, noble moral ideals and lofty aspirations for considerable medical behaviour.

It is significant that the Greeks did not bother about details of "ethical practice." The guiding principle was that the physician should help, or at least do no harm to suffering humanity. To be certain of good character on the part of physicians it is probable that the several groups of teachers at the Asclepieia and Iatreia (the health temples and public medical centres) required an indenture of persons training for the practice of medicine. This probably developed into the famous oath of Hippocrates. Its chief provisions were that the physician should call a consultant if in doubt; be reasonable in fees, and if necessary or possible forego them entirely; lead a pure and moral life, trying to be, in the highest sense of the word a philosopher, and respect and honour his teachers. The physician should not give nor sanction the giving of a poison, cause nor encourage abortion, use his position to debauch a patient nor any member of the patient's household, divulge information about a patient, advertise in any manner, nor assume ostentation in dress or manner. These simple criteria of professional dignity were the ideals of medical etiquette for over two thousand years and are still the traditional basis of modern codes. Practically every great leader in medicine has echoed the admirable ethical principles of the Hippocratic writings.

At the beginning of the last century a publication appeared which deserves to rank as a prominent landmark of progress in these matters. Percival's "Code of Medical Ethics," a classical book in its best sense, is so good that it has served as a paradigm for nearly all books and pamphlets that have been published since that time. Thomas Percival was born September 29, 1740, in Warrington, Lanc. His parents died when he was three years old, and he grew up under the guidance of an elder sister. Handicapped physically by poor vision and headaches, Percival was a scholarly and judicious thinker, highly respected for his personal charm and character. He was greatly interested in social problems and his whole life was influenced by love for his fellowmen. With the rise of industrial manufacturing, Percival became impressed with the necessity for improving factory hygiene, and advocated regulations for ventilation, rest rooms, and general cleanliness. He was not only an excellent private practitioner but he also engaged in philosophical and experimental inquiries. The topics of encouragement and consolation which he addressed to the sick derived efficacy from a countenance expressive of a benignant sympathy and genuine goodness of heart, and an elegant and impressive character from the abounding stores of an elegant and cultivated mind.

In the code proper, Percival emphasized the combination of "tenderness with steadiness" and "condescension with authority" in the management of hospital and charity cases. Discussion of the case before the patient, particularly when the outlook is bad, should be avoided. Secrecy when required is strictly to be observed, and females are to be treated with the most scrupulous delicacy. Talent for the profession consists in personal qualifications, which are not to be transferred, experience, discrimination, presence of mind, fertility of resources, exquisite tact, above all law, capable of deciding in the critical hour, and a discretionary power like equity, having no established rules. Percival's discussion of conduct in private and general practice is fully as interesting as his comments on hospital practice. The same moral rules of conduct prescribed towards hospital patients holds good. In dealing with the physician in later life, Percival says, "The commencement of that period of senescence, when it becomes incumbent on a physician to decline the offices of his profession, it is not easy to ascertain and the decision on so nice a point must be left to the moral discretion of the individual. But in the ordinary course of nature, the bodily and mental vigour must be expected to decay progressively, though perhaps slowly, after the meridian of life is past. As age advances, therefore, a physician should from time to time, scrutinize impartially the state of his faculties that he may determine *bona fide* the precise degree in which he is qualified to execute the active and multifarious offices of his profession."

"The physician is one whose relation to life and health are of the most intimate character. It is fitting not merely that he should possess a knowledge of diseases and their remedy, but

also that he should be one who may safely be trusted to apply those remedies. Character is as important a qualification as knowledge, and if the legislator may properly require a definite course of instruction, or a certain examination as to learning, it may with equal propriety prescribe what evidence of good character shall be furnished. These propositions have been often affirmed."—*(Mr. Justice Brewer, United States Supreme Court).*

"I hold every man," says Lord Bacon, in the preface of his 'Elements of the Common Laws of England', "a debtor to his profession, from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends, to be a help and ornament thereunto. This is performed, in some degree, by the honest and liberal practice of a profession; when men shall carry a respect not to descent into any course that is corrupt and unworthy thereof; and preserve themselves free from the abuses wherewith the same profession is noted to be infected. But much more is this performed, if a man be able to visit and strengthen the roots and foundation of the science itself, thereby not only gracing it in reputation and dignity, but also amplifying it in profession and substance."

For the average physician, medical ethics (of which there is no satisfactory exposition) means only medical etiquette and actually there is usually as great a penalty attached to a transgression of one as of the other. "Medical etiquette is concerned with the conduct of physicians toward each other, and embodies the tenets of professional courtesy. Medical ethics should be concerned with the ultimate consequences of the conduct of physicians towards their individual patients and towards society as a whole, and it should include a consideration of the will and motive behind this conduct."

Professional men have more specific moral issues confronting them than the mass experience of humanity has evolved rules to cover. This is especially true for the physician whose daily professional activities may often involve a choice between acting in the ideal interests of humanity or in the practical interests of self. Physicians have extremely vital relations with their patients, quite delicate relations with each other, and generally authoritative relations with the public. This complexity of responsibility, honour and prestige, tending as it does to exaggerate both the idealism and the egotism of the practitioner, makes it difficult for him clearly to see one path of righteousness and to follow it alone. As a result, it is convenient for the doctor to find refuge in utilitarianism, the greatest good for the greatest number. This is an ineffectual compromise, for, as Fite has shown, it is really a calculated hedonism. Nevertheless, when one reviews the principle underlying the moral responsibility of medical men, as enunciated by physicians themselves, one feels that medical ethics is not based upon utilitarianism, but on idealism, primarily. From the Hippocratic oath to the latest revision of the Principles of Ethics of the American Medical Association, it is implied by all the medical ethical writers that the ideal ends in the interests of humanity, as the real basis for their remarks, and that these must be compromised only as little as possible in the interests of self.

New conditions are now arising in medical practice. No matter how greatly we may lament the fact, the old family doctor, beloved of us all, is rapidly passing away in the growth of specialization, group-clinics, and general hospitalization of the sick. The close personal relations between the physician and individual patient are disappearing in the routine of technical diagnosis, mass treatment, and nation-wide prophylaxis. Medicine is being recognized, more and more, as a matter for national and international public health effort, rather than as a profession catering to individual ambition. Its aim is its own end—the prevention of disease.

"Physicians and surgeons are occasionally requested to furnish certificates justifying the absence of persons who hold situations of honour and trust in the army, the navy, or the civil departments of government. These testimonials, unless under particular circumstances, should be considered as acts due to the public, and therefore not to be compensated by any gratuity. But they should never be given without an accurate and faithful scrutiny of the case; that truth and probity may not be violated, nor the good of the community injured by the unjust pretensions of its servants. The same conduct is to be observed by a medical practitioner, when they are solicited to furnish apologies for non-attendance on juries; or to state the valetudinary incapacity of persons appointed to execute the business of constables, church-wardens, or overseers of the poor. No fear of giving umbrage, no view to present or future emolument, nor any motives of friendship, should incite to a false, or even dubious declaration. For the general weal requires that every individual, who is properly qualified, should deem himself obligated to execute, when legally called upon, the judicial and municipal employments of the body politic. And to be accessory, by untruth or prevarication, to the evasion of this duty, is at once a high misdemeanor against social order, and a breach of moral and professional honour."

And so I leave with you these thoughts culled from Leake, Percival, Barker and others in the hope that this Academy, beloved of us all, will continue to go forward, and that during its progress, in spite of the changes in medical practice that will certainly present themselves as times change, we shall ever keep our ethical banner high, that we shall see to it that the

superstructure of material medicine does not become too heavy for our ethical foundation, and so destroy it all, that we shall guard well the grand tradition which is the heritage of this Society, and that each member of this Academy will ever continue to understand and to proclaim—"the duties of a physician."

"Nay, come up hither. From this wave-washed mound
Unto the furthest flood-brim look with me;
Then reach on with thy thought till it be drowned,
Miles and miles distant though the last line be—
And though thy soul sail leagues and leagues beyond,
Yet leagues beyond those leagues there is more sea."

Note—The material above dealing with Ethics was taken from "Percival's Medical Ethics," and "Introductory Essays" to "Percival's Medical Ethics" by Chauncy D. Leake, and "Manners and Morals in Medicine," by Lewellys F. Barker, Inter. Clinics, Vol. 11, Series 39, 1929.

Association Notes

The Sixty-Fifth Annual Meeting of the Canadian Medical Association at Calgary

June 18th to 22nd, 1934.

Greetings to the members of the medical profession throughout Canada, from the physicians of the city of Calgary, in the land of sunshine! We extend to you a most cordial and hearty invitation to be with us at the Annual Meeting in June. It will be our endeavour to make this both enjoyable and memorable for you. On two other occasions only has our parent Association met in Alberta. In 1889, amid the beautiful mountainous surroundings of Banff, there gathered together a notable group of our members, if one may judge from a photograph taken at the time and which is still a treasured possession. Among this number are those whose names were well known in both Eastern and Western Canada and others who have been known to us in the West. In 1912 Edmonton claimed the honour of having the second meeting in Alberta. This was at a time when the west was aglow with the boom spirit and prosperity was evident everywhere. This meeting was a memorable one, not only for the scientific value of the program but also by reason of the unbounded hospitality which was extended to the visiting members.

CALGARY

The City of Calgary belongs to the plains as well as to the foothills and has been aptly named the "Foothills City." Here eighty-five thousand people live within its confines. It is set in a lovely valley, on both sides of and between the Bow and the Elbow rivers, which flow down from the mountains. To the west lie the foothills and to the east the long stretch of the plains. On the western horizon may be seen rising in silent grandeur the majestic peaks of the Rocky Mountains, which are snow-capped most of the year, and to the eye seem not more than fifty miles away, so clearly does their ruggedness stand out. Within a little over two hours' ride by motor lies the incomparable Banff, with its wonderful surroundings, with peak rising on peak, and peacefully through the town flows the Bow river. Not far distant to the westward are many points of great scenic beauty, including the glorious Lake Louise.

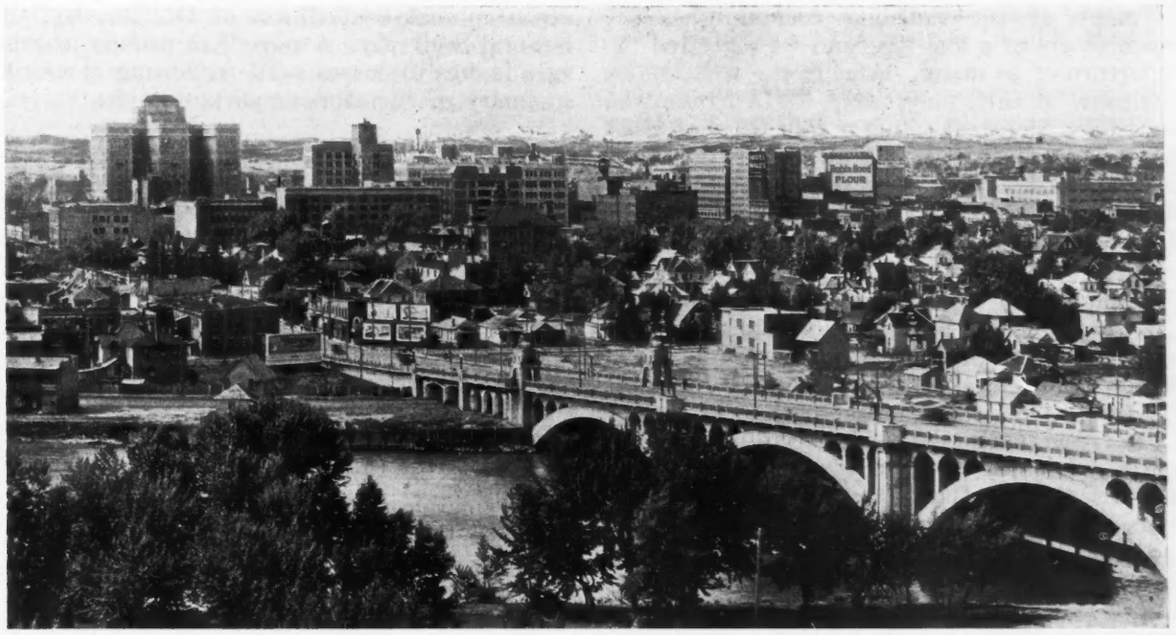
The city of Calgary had its origin from very small beginnings. In the month of August, 1875, a troop of the Northwest Mounted Police, in charge of Inspector Brisebois, received instructions to proceed south and construct a fort at the confluence of the Bow and Elbow rivers. Looking down into the valley from a point on the hill to the north of this location, it was decided where the site of the fort would be, and here the first habitation was built. It was called Fort Brisebois, but on the 29th February, 1876, orders were issued that the name should be changed to Fort Calgary. The name Calgary was suggested by Col. James F. Macleod who was in charge of the North West Mounted Police stationed at Fort Walsh, now known as Macleod, in the far southern portion of Alberta. Calgary was so named by Colonel Macleod from a place near his home on the Isle of Skye and means in Gaelic "clear running water." The name Fort Calgary was approved of by the Dominion Government, and some years later the term "Fort" ceased to be, and this frontier post was incorporated as a town in 1884. At this date the population numbered 428. A monument in the eastern part of the city now marks the site where the original Fort Brisebois stood.

No one knows the number of centuries the various tribes of Indians have dwelt on the western prairies, but we do know that before the Dominion Government sent the Northwest Mounted Police into this country constant warfare was carried on by the different bands, which made it unsafe for settlement on the land. In the early days, the valley of the Bow and Elbow rivers was a suitable and convenient place to meet, because the wood along these rivers was of the best quality in the northwest for the making of bows, and the site of Calgary was a business centre for Indian tribesmen many centuries before the white man came into possession of this land.

According to well-authenticated records, the Chevalier de Niverville was the first explorer of this far western country. He lead a party along one of the great rivers into the present Province of Alberta and established the mysterious Fort la Jonquière near the Rocky Mountains in 1751. Whether this was situated near the present townsites of Edmonton or of Calgary is a matter for conjecture.

Almost invariably, the early explorers came seeking wealth in one form or another, and not to obtain fame or glory in searching for new territory, or in defining new pathways, or in tracing to their sources the larger rivers. De Niverville had dreams of obtaining gold and jewels, and Anthony Hendry, who came down from the Hudson's Bay in 1754, hoped to persuade the Blackfoot Indians to go to Hudson's Bay to trade their furs instead of to the French post along the Great Lakes. During the first fifty years of the past century there were a few noteworthy travellers and explorers to this part of the Northwest, including Sir George Simpson, Chief Factor of the Hudson's Bay Company, who made a remarkably fast journey for those times; Sir John Franklin, travelling by slow stages and going through the northern part of this province towards the Arctic regions where later he perished; David Douglas, a botanist, who, serenely unconscious of danger, gathered flowers for the Royal Horticultural Society of Great Britain; and Paul Kane, the first great Canadian artist, who prepared for posterity his sketches of the "Great Lone Land."

During the latter half of the past century a steadily increasing amount of interest was taken in this western country and its great possibilities, and potential sources of wealth were realized. In 1855, Captain Palliser, the hardy explorer, sat down within the shelter of old Fort Edmonton to write out his report on the exploration he had made on behalf of Her Majesty Queen Victoria of that portion of the Imperial possessions which now comprises the Province of Alberta. He had also written home to London of what he had learned of the physical characteristics, climate and agricultural possibilities of the territory he had covered, while making his headquarters at the Hudson's Bay trading post on the banks of the North Saskatchewan river. In 1860, Mr. S. J. Dawson and Mr. Henry Yuile were sent out to this country by the Dominion Government to make reports. In 1874, the North West Mounted Police, which had been formed on the recommendation of Captain Francis Butler, the author of "The Great Lone Land", started on their journey westwards, and in this year, divisional headquarters were established at Fort Walsh, later to be known as Fort Macleod. It was not long before better law and order prevailed and just punishment was meted out to the wicked. This fine body of men has done much for this Western country and has ever upheld the finest traditions of British justice.



The City of Calgary

The coming of the Canadian Pacific Railway in 1883 opened a new era in the West. This railroad was the advance guard of civilization, and following this big undertaking came a period of settlement of tracts of land in many parts of the Northwest Territories, at first slowly, but with the advent of the new century with steadily increasing momentum.

Southern Alberta is an ideal ranching country.

In early times the buffalo, in thousands, grazed in this region. In the late "seventies" they were ruthlessly slaughtered, and it was not many years before the buffalo became extinct on the western prairies. The quality of the grass, the open winters, with comparatively little snow, are the factors which have produced the finest beef in the world in this western region. Little wonder is it that scions of many British noble families settled in this part of Alberta, taking over large tracts of land upon which to raise cattle. The ranchers had ever contended that southern Alberta was a better ranching than farming country. They were probably right, but we were to find, at the beginning of this century, large numbers of farmers from Eastern Canada and from the United States, coming in to take up land, with the gradual elimination of many of the ranching community. The ranchers are of a fine type and we regretted the departure of so many. Among the well known cattlemen of early days were A. E. Cross, who came from Montreal, Senator Dan Riley of High River, Mr. George Lane, owner of the well-known Bar-U ranch, the Honourable Archie McLean and Senator Patrick Burns. Senators Riley and Burns are still in our midst.

We are justly proud that His Royal Highness, the Prince of Wales, some fourteen years ago, purchased the Frank Bedingfeld ranch and became a citizen of Alberta. He could not have chosen a more ideal location. Leaving the town of High River, forty miles south of Calgary, which from early days has been a ranching centre, we journey in a southwesterly direction, not over the old Bar-U trail, which for thirty years or more was the shorter route to the Bar-U and the Bedingfeld ranches, but along the regulation roads, which are kept in good order. As we come to the end of the plateau overlooking the valley where the Prince of Wales' ranch is, a scene of wonderful beauty meets our eyes. There is an apparently unending stretch of foothills, rising from the valley in the distance, tier on tier, and clearly outlined beyond is the serrated line of the Rocky Mountains, running north and south. To the north is Mount Head and to the south Mount Sentinel, which stand out pre-eminently. As we journey four miles further down across the plain to the west, we come to the well-known Bar-U ranch, one of the largest in Alberta, and owned by Senator Burns. Two miles further on, amid the spreading cottonwood trees and the winding Pekisko creek, lies the Prince's ranch, where on his visits to Alberta, and in his hours of freedom from duties, he has enjoyed to the full his hours of leisure and adopted the rôle of the Royal Rancher.

G. E. LEARMONTH,
on behalf of the local
Publicity Committee C.M.A.

EXECUTIVE COMMITTEE

November 28, 1933

The Executive Committee of the Canadian Medical Association met in the Chateau Laurier Hotel, Ottawa, November 28th.

The following were present:— Drs. A. T. Bazin (*Chairman*), F. S. Patch, Montreal; G. A. B. Addy, Saint John; Geo. S. Young, F. N. G. Starr, Toronto; K. A. MacKenzie, Halifax; A. S. Kirkland, Saint John; J. D. Adamson, Winnipeg; Léon Gérin-Lajoie, Montreal; A. G. Nicholls, Montreal; J. E. Bloomer, Saskatchewan; J. S. McEachern, Calgary; J. G. FitzGerald, Toronto; A. Primrose, Toronto; A. Grant Fleming, Montreal, and G. Harvey Agnew, Toronto.

The Chairman expressed great regret at the absence because of illness of Dr. Routley, the General Secretary. A more than usually lengthy agenda was discussed. The following is a brief summary of the more important topics.

COMMITTEE ON ECONOMICS

DR. FLEMING presented the first section of the Report of the Committee on Economics, of which he is Secretary. He stated that it is the intention of the Committee to prepare a draft of this report in two parts, part one to be a general review of the subject of health insurance; part two to deal with the Canadian situation and to include definite recommendations. The final report will be submitted to the membership at large.

REPORT OF THE COMMITTEE ON ETHICS

A communication had been passed to the Committee on Ethics from the Academy of Medicine, Toronto, stating that the Bell Telephone Company has refused to put any designation opposite a doctor's name in the "white" section of the Telephone Directory, except the word "physician" or "surgeon". It was the feeling of some members of the Academy that a practitioner should be able to name his specialty in this section of the Directory. The officials of the Bell Telephone Company are willing and anxious to list doctors in the "yellow" advertising section as fully as they may wish, charging them for this.

After considering the report of the Committee on Ethics very carefully, it was finally resolved:

That, whereas the Code of Ethics of the Association states that "it is derogatory to the dignity of the profession to resort to public advertisements, or private cards, or handbills inviting the attention of individuals affected by particular diseases, publicly offering advice and medicine to the poor gratis, or promising radical cures; to publish cases and operations in the daily prints, or suffer such publication to be made; to invite laymen to be present at operations, to boast of cures and remedies; to adduce certificates of skill and success; or to perform any other similar acts;"—this Executive Committee of the Canadian Medical Association considers that the placing of a name in large type in the Telephone Directory is interpreted as advertising; and

that the Bell Telephone Company should be so advised; and also that the profession should be so advised through the medium of the *Journal*. *Carried.*

The custom in smaller places of placing a card in the local newspapers, giving a Doctor's address and office hours, was discussed, but no action was taken.

REPORT OF THE COMMITTEE ON MATERNAL WELFARE

At the last meeting of the Executive Committee held in Saint John, after consideration of the report of the Committee on Maternal Welfare, a resolution was passed instructing the General Secretary to bring to the attention of the provincial medical associations the large percentage of deaths due to puerperal septicæmia and requesting each of these associations to urge their members to observe the regulations with regard to the reporting of all such cases. It was reported that these instructions had been carried out by the General Secretary.

THE DEPARTMENT OF HOSPITAL SERVICE

DR. AGNEW reported that, so far in Canada, we have been able to avoid a situation which is likely to produce a great deal of difficulty in the United States. In the United States the hospital world and the medical world have grown quite apart, despite the efforts of the American Medical Association to bridge the gap. The hospitals in the United States which do not receive grants such as our hospitals receive have been faced almost with bankruptcy. Many have adopted various forms of *group health insurance*. The American Medical Association has opposed any form of group insurance. In Canada we find the Canadian Medical Association definitely linking up with the hospitals, a situation which has been favourably commented upon by many American leaders.

It was remarked in discussion that some day we are going to be asked what is the attitude of the Canadian Medical Association towards a group hospitalization plan. We should settle on our policy.

It was finally resolved,—

That the information available on Group Hospitalization be sent by Dr. Agnew to all members of the Executive Committee; and that the Chairman appoint a special committee to bring in recommendations to the next meeting of the Executive Committee. *Carried.*

Standardization of medical practice in hospitals. — Dr. Agnew also reported that the Council of the American Medical Association has taken on its shoulders the task of attempting to formulate standards of medical practice in hospitals. They are cognizant of the fact that each hospital has more or less its own regulations. In order to make this a comprehensive study, the Council of the American Hospital Association has arranged for a joint conference with the American Medical Association and the American College of Surgeons. These three bodies are meeting this winter and it is hoped to effect a comprehensive study of various aspects of hospital work. In as much as any policy adopted by this joint committee would have a far-reaching effect on our procedure with Canadian hospitals, he was convinced that this report would have more weight in Canada if the Canadian Medical Association could be invited to sit in. He was on the Nucleus Committee, as a representative of the American Hospital Association, and not as a member of the Canadian Medical Association. He felt that we would be well advised to consider seriously the question of adding a direct representative of the Canadian Medical Association to this Committee. No direct invitation had been received, but he was bringing up the matter at this time because, if this Executive Committee was in favour, the matter might then be arranged.

It was agreed that we watch developments before appointing any official representative to sit in with the American Medical Association, American Hospital Association and the American College of Surgeons in their proposed study.

THE DEPARTMENT OF PUBLICITY IN HEALTH EDUCATION

DR. FITZGERALD reported that he and Dr. Fleming would recommend that the Canadian Medical Association, through its Department of Publicity and Health Education, should publish a series of small booklets and put these on sale in bookstores and departmental stores, the intention being to sell them at about twenty-five cents a copy. The subjects dealt with would be those of interest to the general public, such as cancer, diabetes, heart disease, nutrition, etc.

The public would, we think, welcome information on health matters from the official medical organization of Canada. It was moved and seconded,—

That the Executive Committee approve of the principle outlined above and that the Department of Publicity be responsible for the compilation of these booklets on health topics. *Carried.*

MEDICAL RELIEF

At the meeting of the Executive Committee held in Saint John in June, 1933, it was agreed that the President, the President-Elect, the Chairman of Council, and the General Secretary, be authorized to go to Ottawa to make representations to the Prime Minister at the first opportunity after his return to Ottawa, reporting to him the decision of the Association at this annual meeting in respect to medical relief. The result of this interview has already been published in the *Journal* (1933, **29**: 554).

In discussion it was stated: "I think the Right Honourable Mr. Bennett made a very reasonable reply to the delegation, but the provinces have not assumed their responsibilities. Sickness is first an individual matter, then a

matter for the municipality, and then for the provincial government. The Provincial Governments have not done their share and, before we can expect anything from the Federal Government, the provincial governments must accept their responsibilities."

Also, "The provinces say that the Prime Minister has refused to let them use any of the federal money for medical relief."

Also, "There is nothing to prevent a province using its own money and then going to the Federal Government for more."

Also, "The provinces have no money. They cannot go on. We should do something definite here because, when I go back to , there will be a delegation to meet me, to ascertain what has been done by this Executive Committee. We have been awaiting Mr. Bennett's letter ever since the last meeting of the Executive. If we do not do something definite now, the medical men at home will want to know why. I think a personal interview with Mr. Bennett is the only way to bring this matter to a head."

It was finally moved and seconded,—

That the Chairman of this Executive Committee be authorized to attempt to obtain an interview with the Prime Minister either to-day or to-morrow; and also that he be authorized to select what support he wishes from the members of this Executive Committee. *Carried.*

BLOOD TRANSFUSIONS

Correspondence was presented indicating that arrangements were now completed for securing blood donors through the St. John Ambulance Association. The Canadian Medical Association is to notify all subsidiary medical associations and hospitals that an arrangement may be secured by submitting a request addressed to the Director-General, St. John Ambulance Association, Ottawa, or the Chairman of the provincial council concerned, for a group of St. John Ambulance Association donors to be organized in their district.

It was moved and seconded,—

That the Sub-Executive Committee be instructed, after consultation with the head office of the St. John Ambulance Association, to draft a set of rules under which this blood transfusion service will be operated in an ethical manner. *Carried.*

SECTIONAL OFFICERS

It was reported that out of thirteen sections in the Association only one has appointed officers in the year 1933. Looking to the Calgary meeting; eight have officers who were appointed at the annual meeting in Toronto in 1932; one section has a permanent secretary, but no chairman has been appointed; and the remaining three have no officers. The following were appointed for the purposes of the Calgary meeting.

Surgery—
Dr. John A. Gunn, Winnipeg, *Chairman.*
Dr. John Palmer, Calgary, *Secretary.*

Medicine—
Dr. E. L. Pope, Edmonton, *Chairman.*
Dr. M. G. Cody, Calgary, *Secretary.*

Eye, Ear, Nose and Throat—
Dr. R. B. Boucher, Vancouver, *Chairman.*
Dr. J. N. Gunn, Calgary, *Secretary.*

Public Health—
Dr. M. R. Bow, Edmonton, *Chairman.*
Dr. W. H. Hill, Calgary, *Secretary.*

Historical Medicine—
Dr. D. A. Stewart, Ninette, *Chairman.*
Dr. Heber Jamieson, Edmonton, *Secretary.*

Urology—
Dr. Emerson C. Smith, Edmonton, *Chairman.*
Dr. J. C. McClelland, Toronto, *Permanent Sec.*
Dr. John Palmer, Calgary, *Local Secretary.*

Radiology—
Dr. W. H. McGuffin, Calgary, *Chairman.*
Dr. B. R. Mooney, Edmonton, *Secretary.*

It was also suggested that the Chairman of the different sections arrange for some other member of their particular group to preside over parts of the meetings of those sections, such presiding officers to be noted on the program, the object of this being to avoid too much strain on any one or two men. This suggestion received the unanimous approval of the Executive Committee.

NOTICE OF MOTION TO COUNCIL

DR. STARR gave notice of motion that Chapter four, section two, of the By-Laws of the Association be amended to read as follows,—

"Where any section fails, for any cause, to appoint sectional officers in any year, it shall be in order for the Executive Committee to nominate officers for that section for the ensuing year."

NATIONAL RESEARCH COUNCIL AND RADIOLOGY

Correspondence was presented to the last meeting of the Executive Committee from the National Research Council of Canada, stating that, at a conference held in Kingston on May 17, 1933, it was recommended that a letter be sent to the Canadian Medical Association, setting forth the following plan of the National Research Council, and requesting that, if the Canadian Medical Association were interested, an announcement concerning this plan be made at the annual meeting of the Association in June, 1933. The plan referred to was the establishment of an associated research committee on the medical application of x-rays and radium, which would promote and supervise all researches and standardization taken up by the Council under this heading. The personnel of the committee, which the Research Council proposed to appoint at its next meeting in July, 1933, would consist of prominent and active radiologists of the medical profession, together with physicists who, by their training and ex-

perience, are competent to engage in research and standardization and other activities of medical x-ray, and radium work. The National Research Council expressed the hope that they might have the active interest, cooperation and backing of the Canadian Medical Association in this regard. At the annual meeting in Saint John this matter was referred to the Section of Radiology for study and report.

A communication was later received from Dr. A. S. Kirkland, Chairman of the Section of Radiology, stating that this matter had been submitted to the officers of his Section and to other radiologists, and it was the unanimous opinion that the whole-hearted support of the radiologists of Canada should be given to the National Research Council in this particular, and that the entire group of radiologists would offer their cooperation to the National Research Council in any future work they may undertake.

It was finally moved and seconded,—

That we express our approval of the plans of the National Research Council with reference to the standardization of deep x-ray machines and radium. *Carried.*

ROYAL SOCIETY OF CANADA *re* AFFILIATION

A letter from the Honorary Secretary of the Royal Society of Canada was brought to the attention of the Executive Committee, inviting the Canadian Medical Association to become affiliated with the Royal Society, to the end that they might cooperate in carrying out undertakings in which both are interested.

It was moved and seconded,—

That this Executive Committee recommend to Council that the Canadian Medical Association become affiliated with the Royal Society of Canada. *Carried.*

CIRCULAR LETTER FROM DR. BAZIN *re* ANNUAL MEETINGS

Consideration was given to the circular letter sent to the members of the Executive Committee by DR. BAZIN, calling attention to a number of points which, in his opinion, should be corrected in connection with arrangements for and the carrying on of future annual meetings of the Association. The following opinions were expressed,—

Entertainment.—"I think we should do away with all entertainment, including golf, and devote the three days to scientific sessions."

"I am quite in accord with this."

"I do not think anyone has made many personal friends by sitting inside attending scientific sessions. He makes his friends on the golf course and at the other entertainments."

"I am personally opposed to doing away with all the entertainment at conventions, but we might recommend to subsequent annual meeting committees that the purely recreational and social activities be so planned as not to interfere with the scientific program."

"I do not think we should lay down hard and fast rules with regard to entertainment."

"If this Executive Committee takes control of the scientific program and arrangements all our meetings will be well attended, because they will be well worth attending. If a few go to play golf, this will not interfere with the scientific program going on at the same time. We should provide a program that will be of such an excellent character that it will attract. That does not mean that we are going to neglect the general practitioner, nor does it mean that it would be necessary in certain sections of the country to provide a program which might be termed 'too scientific'."

"So far as sectional meetings are concerned, I do not think we should decide not to hold these unless we are assured of an attendance of at least fifty. Sectional men have two functions to perform:— (1) a discussion of their own technical problems; (2) if they expect the general practitioner to refer cases to them, they must demonstrate to him what they are capable of doing; and therefore their sectional programs could be arranged so as to be attractive, or some papers could be included in the program for general sessions. Then, again, the Association is responsible to certain of the sections who came in, giving up an individual national existence, and we should permit them to meet every year at the time of the annual meeting."

"I think a great many of those sections will be almost absolutely made up of specialists, and their papers will not be of any value to the general practitioner. A symposium would allow the general practitioner to see what is being done in special practices, such as one on cancer or goitre."

"That need not prevent a group of specialists getting together and discussing their own problems. Give them an opportunity of having a sectional meeting and also have them take part in the general program. The organization of sections might be as in the British Medical Association. The chairman is chosen because he has a reputation in that specialty. In addition, there should be a vice-chairman who is a local man. Have a permanent secretary and also a local secretary."

Finally it was moved and seconded,—

That any entertainment held during annual meetings be so arranged as not to interfere with the regular scientific sessions. *Carried.*

It was also moved and seconded,—

That all entertainments put on in connection with annual meetings be announced in the program for the meeting. *Carried.*

Responsibility for program.—In Dr. Bazin's opinion, as expressed in his circular letter, the Executive Committee should take over *in toto* the full charge of the program for annual meetings.

"Does that mean that this will be done through the Central Program Committee, which is a sub-committee of the Executive Committee?"

"Yes, through its Central Program Committee."

"Should we infer that no reference would be made to the Local Committee?"

"The Central Committee should decide on all details, but there might be reference to the Local Committee."

"I have in mind the meeting in Montreal in 1935. Surely you would not want the Central Program Committee to function in this case."

"You cannot make fish of one and flesh of the other."

"As it is now, plans are initiated locally and approved centrally. According to the new idea, plans would be initiated centrally and approved locally."

"I think it should be pointed out that a program never can be ideal. It is a compromise between one's ideals and something lower than that. If it were possible to select a list of names of men who represent the highest in the profession, it would be a simple matter to produce a program of ideal quality, but that cannot always be done. One has to do the best one can with the material that is available. It is very difficult to get the subjects you want and the men you want."

"We should insist on time being allowed for discussion."

It was moved and seconded,—

That this Executive Committee instruct the Central Program Committee that where possible they allow time for discussion in arranging the program of annual meetings. *Carried.*

Lanterns, darkening of rooms, etc.—After discussing the above matter, it was moved and seconded,—

That the Central Program Committee bring in to the next meeting of the Executive Committee a report suggesting improvements in arrangements and programs for annual meetings. *Carried.*

Report of the Executive Committee.—"This report should include the business which comes before the Executive Committee. The report of the General Secretary should be a report of an individual who has, more than anyone else, an opportunity of surveying conditions and attitudes throughout Canada, and who is able to make a survey of the past and prognosticate for the future, also giving details with regard to his own activities and the activities of his office."

"The statement of the proceedings of the Executive Committee should not be 'a bare statement of facts,' but should be as comprehensive as possible, in order to give the members of Council an idea of what has been done."

It was moved and seconded,—

That two reports be presented to Council, one, the report of the Executive Committee, which shall be prepared by the General Secretary but be signed by the Chairman of the Executive Committee; the other, the report of the General Secretary. *Carried.*

CANCER

Copies of the report of the Study Committee on Cancer, as presented to Council at the annual meeting in Saint John, were passed to the Executive Committee for consideration. It was moved and seconded,—

That the report of the Study Committee on Cancer be considered as a whole. *Carried.*

The following recommendation from the report of the Study Committee on Cancer then came up for special consideration,—

"That the Council of the Canadian Medical Association take the initiative in organizing a Canadian Society for the Control of Cancer. This Society will be open for membership to all citizens who are interested in the cancer problem. The membership fees and contributions received will provide a fund, which will finance the cost of the various activities in connection with the dissemination of information about cancer to the medical profession and to the lay public. This organization should have a branch in each province and a local chapter in all towns and cities where a sufficient number of people could be interested in the work. Each local chapter would provide a medium through which the public would receive information about cancer in the form of addresses and by distribution of literature prepared by the Cancer Department of the Canadian Medical Association."

"What we should have is a very strong, small committee of the Association, to be known as the Cancer Committee."

"I would go farther than that. I would approve the development of an organization outside the Association. We could assist this latter organization in an advisory capacity, if desired, and we could at all times give them our fullest cooperation. I think the proposed organization should be linked up with the British Empire Cancer Campaign."

"I am in entire agreement with Dr. McEachern that some organization should be established. I think it should be somewhat similar to the British Empire Cancer Campaign. We should have a Cancer Commission to raise funds. I am of the opinion that this could be done even in these strenuous times, if it were gone about in the right way, and I think it could be done by securing a business man to head such a campaign."

"Certainly there is a wide field of work, but one almost hesitates to support the idea of another voluntary health organization. At the same time, if that is the way to do it, we should start out. I think this work should be done by a separate organization, but perhaps in the early stages it should be controlled by the medical profession. There is a possibility of this type of work getting into the hands of a lay

group in the future whose policy might be opposed to what we think it should be."

"There is no suggestion at the moment that this lay committee, composed largely of business men, should have anything to do with the work of the cancer organization beyond the raising of funds to support it."

"I rather favour the idea of the control of this cancer organization by the Canadian Medical Association."

"I think we could swing a national organization, but we should decide what type of organization it is to be, and whether it is to be supported by grants or by membership fees."

"If we commence our organization with the names of a number of prominent men at its head, I feel sure we could raise the necessary money in Canada to-day."

"Would we be more certain of keeping control of the medical aspect of the work if we initiated it in our own ranks, under the direction of our membership and of the profession, so far as we could without any funds, and then demonstrate to the proposed organization that we were a going concern requiring to branch out for the education of the public, and that we consider it better for the education of the public to go on through a lay organization rather than through the medical profession?"

"The first thing is to collect a sufficient amount of money to have a full time secretary."

"I am quite sure that our Patron, the Prince of Wales, would not only give us very valuable advice but might render some assistance in helping to put the plan over."

"There have been a great many men throughout Canada who have been intensely interested in the subject of cancer. What we need now is not a discussion of detail, but to establish an organization that will carry that out. The more I have thought of this the more I feel that it is absolutely essential that the whole thing be kept under the control of organized medicine. My fear is, that if we form an organization such as has been referred to, perhaps not in our time but later, this may get out of the hands of the medical profession, and they will find themselves in a position where they are dictated to by masterful laymen. There are really two problems in the educational program: one, the education of our own profession in regard to the recording of all the details that are obtainable with reference to each individual case of cancer; two, the problem of educating the public. In this latter, it seems to me that, with regard to the problem of finances, our educational program and our request for assistance should not be limited to the few wealthy people of the country, but to every man and woman, regardless of their financial condition. We would then have a much larger constituency to carry our campaign to the public.

"I would suggest that this Executive nominate a Central Executive Committee, with a chairman and nucleus, preferably in one of the eastern cities, and empower them to enlarge the Committee by the addition of *ex officio* members, one of whom would be the chairman of the Cancer Committee in each of the provinces where a Cancer Committee has been formed; that they be immediately instructed to select a young active man as Associate Secretary, and that this Association make a loan to finance his activities until a permanent means of financing has been established. The work cannot go on without some enthusiastic individual travelling about Canada to stimulate interest in carrying it on and to ensure some degree of uniformity in doing the work in various parts of Canada. There might also be an advisory council who would aid by correspondence. Each advisory committee would be asked to appoint a certain number of members to this council according to the population of the province. The Central Executive Committee should be asked to decide upon a standard form which would be acceptable to the various cancer committees of the provinces. On this form the histories of each of the cases should be tabulated. Then my own feeling is that it would be wiser to have as an auxiliary body, a lay or medical-lay body, and through this body money should be secured and facilities provided for reaching the general public. I would suggest that the Central Executive Committee, nominated by this Canadian Medical Association Executive Committee, be instructed to take steps to form that auxiliary lay or medical-lay body to approach a number of people such as the Prime Minister of Canada and other influential persons, and form a central nucleus of that auxiliary body. The Central Executive Committee, nominated by the Canadian Medical Association Executive Committee, might be automatically members of the medical-lay body. That would insure a constant bond of union between the two, and it would also ensure that the lay body would not get control of the matter and put into force some ideas that are not in accordance with those of organized medicine. The duties of that lay organization would be largely to raise funds and to provide for the dissemination to the general public of knowledge regarding cancer. The next step for the lay body would be to organize provincial units and then units in smaller places. I think if the matter were gone at earnestly we would have in six months sufficient money to run it for a year. There should be a systematic canvass made of the people throughout the whole of Canada."

"Would there not be overlapping with existing cancer bodies?"

"As soon as this central organization is established it would immediately coordinate the activities of the existing cancer committees."

"We have a Cancer Relief Institute in Winnipeg which has been in existence for four years. They have impressed upon me that

they are very anxious that there should be a Federal organization to coordinate the activities and accumulate records, etc. It would be necessary to investigate organizations in the various provinces before anything definite could be done by us."

"Would it not be a good thing to get all these organizations working together? If we started out to raise half a million I believe if we were to put it into the hands of an organizer, we would have the amount without any doubt. As to the name of such a campaign, I would suggest the Canadian Cancer Campaign and it should be affiliated with the British Empire Cancer Campaign."

"The first thing to do would be to outline a very definite program of what we are going to do, what it will cost, etc."

"I am convinced of the necessity for some organization. The only thing is who should do it; whether this Association should do it separately or otherwise."

It was moved and seconded,—

That the Canadian Medical Association take immediate steps to initiate the formation of a national society for the combating of cancer in Canada, which organization shall coordinate all the various cancer organizations now in Canada; and that a Committee be appointed by the Chairman of this Executive Committee to study the question and report to the next meeting of the Executive Committee as to the nature and character of such an organization and ways and means which should be adopted to effect it. *Carried.*

ANNUAL MEETINGS: NOTICE OF MOTION

DR. MCEACHERN gave Notice of Motion that the By-Laws of the Association be so amended as to permit of naming the place of the Annual Meeting at least two years in advance.

REPRESENTATIVE ON COUNCIL OF THE DEPARTMENT OF PENSIONS AND NATIONAL HEALTH AND OF AFFILIATED BODIES

DR. BAZIN called attention to the fact that it is necessary to revise the By-laws relating to affiliation, more particularly with reference to the invitation to the Department of Pensions and National Health and various other societies to appoint representatives to Council, and the privileges of these representatives. It was finally moved and seconded,—

That this whole matter be referred to the Sub-Executive Committee for study and report as to what it is desirable should be stated in the By-Law; and that it be then referred to the Committee on Constitution and By-Laws for the framing of the By-Law, and that they report back to this Executive Committee. *Carried.*

WESTERN PROVINCES AND POST-GRADUATE TEAMS

Some discussion ensued as to what plans should be made for post-graduate teams during the next year and it was finally moved and seconded,—

That, as the annual meeting of the Canadian Medical Association is to be held in Calgary in 1934, post-graduate speakers be not sent through the Western Provinces; but, if the annual meetings of the Maritime Provinces can be held in sequence, we send a team of speakers to attend these meetings. *Carried.*

REPORT OF THE EDITOR

DR. NICHOLLS presented a report dealing with various matters concerning the publication of the *Journal*. He called attention to the fact that the work of the *Journal* would be much facilitated if the secretaries of the various sections would send him copies of their minutes with recommendations as to the publication of their material. It was agreed that the General Secretary should communicate with the secretaries of sections asking for their cooperation in this matter.

DR. NICHOLLS also pointed out that there is so much scientific material awaiting publication, that he finds it absolutely impossible to print provincial presidential addresses in full. After considering this matter for some time, it was moved and seconded,—

That the question of the publishing of provincial presidential addresses be left entirely in the hands of the Editorial Board. *Carried.*

DR. NICHOLLS expressed the opinion that it might be of interest to the membership, and also increase the interest of the members of Council, if they had advance knowledge of the subjects which are being discussed from time to time by the Executive Committee. He considered that it would be of value to publish in the *Journal*, before the annual meeting, the findings of some of the important committees of the Association, such, for example, as the Committees on Cancer and Economics. In his opinion, the *Journal* might be used also as a medium to suggest useful policies and advise the profession as to the opinions of the Executive on various matters.

"I think this is a good idea."

"I think an abstract of the minutes of this meeting would be helpful. Even though we do not always come to a conclusion, we show that we are making progress along certain lines."

It was moved and seconded,—

That we approve of the plan as outlined by the Editor, of publishing advance information on subjects which are to be discussed by the Executive Committee, and which are being studied by other committees of the Association. *Carried.*

REPORT OF THE CENTRAL PROGRAM COMMITTEE

DR. GEO. S. YOUNG, Chairman of the Central Program Committee, reported that, at a meeting of the Committee held on October 23rd, a tentative outline for the program was agreed upon, and thirty-eight invitations issued to speakers whose names had been suggested by the Local Committee. To date, we have received about a dozen replies to these invitations. The general

arrangement is for two divisions, medicine and surgery, to meet simultaneously in the mornings with general sessions in the afternoons. There will be meetings of the Sections of Radiology, Urology, and Eye, Ear, Nose and Throat. Dr. James Craigie, of the Connaught Laboratories, has been selected to deliver the Blackader Lecture on Diseases of Children.

It was unanimously agreed that a message be sent to Dr. Routley, expressing the regret of the members of the Executive Committee at his illness and the hope that he may soon be quite recovered.

Medical Societies

The Calgary Medical Society

The first meeting of the Calgary Medical Society was held on October 10, 1933, when an address of much interest was given by Dr. W. H. Hill, on "Recent advances in the diagnosis and treatment of lobar pneumonia." Of the numerous microorganisms which may cause pneumonia, the pneumococcus of Weichselbaum produces an acute febrile infection, associated with the consolidation of lung tissue, and in typical cases ending by crisis. This pneumococcus is found not only in the lung substance but in the respiratory tract and in severe cases in the blood stream of the patient. Ten per cent of deaths from all causes in the United States registration area, between the years 1920 and 1930, were due to pneumonia, and this disease accounted for approximately 9 per cent of deaths from all causes in Canada in 1930. Rosenau and others showed that there was an increased prevalence of fixed types among normal persons associated with pneumonia cases. Of the four main types of pneumococci the first three are based upon fixed and specific immunological reactions. Type 4 is a heterogenerous group, of many different strains which are frequently found as commensals in normal mouths. Cooper, of New York, has identified some 28 types from strains of group 4 and has prepared specific sera for each type.

Carbone and Fra, of Italy, in 1891 first demonstrated that the serum of rabbits previously inoculated with pneumococci was protective to other rabbits against infection with the types used, and they were the first to treat pneumonia in the human subject. Neufeld and Hendel, in Germany, and Gillespie, in New York, between the years 1909 and 1913, showed the existence of three serologically different types of pneumococci. Dochez and Avery, in 1917, demonstrated the presence of a polysaccharide which was precipitated after culturing the pneumococci, and it has been demonstrated in the blood and urine of two-thirds of patients with pneumonia. Sabin's method of rapid typing was described. Dr. Hill reviewed fully the work of Felton in the production of his serum and the good clinical results which have attended its use. The mortality rate has been considerably reduced with the use of concentrated Felton's serum.

G. E. LEARMONTH.

The Edmonton Academy of Medicine

The October meeting of the Edmonton Academy of Medicine was held on October 4th, the President, Dr. Harold Orr, in the chair. After the preliminary business, two well prepared and highly scientific papers on the subject of allergy were read. Dr. P. H. Sprague treated the subject under the head of "The fundamental principles in the diagnosis and treatment of allergic diseases." Although allergic diseases were recognized as early as the 16th century, no real progress had been made in sifting out the various groups and relating them to their causative agents until early in the 20th century. The differences between allergy and anaphylaxis come under the general heading of hypersensitivity. Presenting the classification proposed by Coca, the speaker, under the allergic group, discussed the hereditary or atopic conditions such as hayfever, asthma, and eczema, serum diseases and contact dermatitis, which affect about 7 per cent of the general population. While in the human being most allergic manifestations are in the skin, gastro-intestinal tract, and respiratory tract, it is very unusual to have two systems attacked at one time. Dr. Sprague discussed the various hypotheses advanced in allergic reactions. The conclusions are that it is probably a histamine-like substance circulating in the blood which causes the conditions. He dealt with the diagnosis of the various conditions and emphasized the point that in the atopic division of diseases skin tests are extremely valuable. In concluding, he discussed the various forms of treatment now in use with special reference to bronchial affections.

Dr. Irving Bell took up the subject largely from the standpoint of the gastro-enterologist, concluding his talk with statistical lantern slides. A summary of his excellent presentation of his subject is as follows. The diagnosis of food allergy requires a careful history and careful physical examination. A gastric analysis may reveal the absence of hydrochloric acid. When this has been done food allergy should be considered. When there is a clear history that the sensitiveness is due to food, and when symptoms complained of, whatever they may be, are unexplainable by the examinations made, it should be considered seriously, especially where there is a history of allergy

in the family history. The various skin tests, such as the scratch, the intradermal and patch method, should be done to further support the diagnosis. Since 1922 various writers have advised diet trial for a variety of allergic complaints.

The general therapy of food allergy is similar to other forms. Adrenalin should be tried in food allergy as well as in asthma and may assist in diagnosis. Peptone has been used as a desensitizing agent, either by oral or intravenous administration. Other suggested measures are, auto-hæmotherapy or serotherapy, calcium therapy, hydrochloric acid, gastric secretion therapy. Climatic and atmospheric changes have their effect in food allergy, but are hard to explain. Finally, the nervous mechanism of allergy must not be overlooked.

In opening the discussion, Dr. Orr explained the triple cutaneous response and the nature of the various antigens. Regarding food allergy, his theory was that incomplete digestion of proteins occurred, resulting in various reactions, due to some intermediate product, and that in certain cases large doses of hydrochloric acid may be given. Dr. Leitch discussed serum diseases and atopic conditions such as asthma, hay-fever, eczema and migraine, and fever, joint pains, urticaria, and œdema resulting from the injection of certain serums. In atopic individuals it is fortunate that there is usually a high resistance to acute infections, as it is in these persons that we must be careful in administering foreign proteins which may cause sudden death. Dr. Norman Allin, in closing the discussion, dealt with allergic conditions from the standpoint of the nose and throat specialist. Dr. Bow referred to the safety of using toxoid inoculation for diphtheria prevention.

T. H. WHITELAW.

University Notes

McGill University

The passing of Sir Arthur Currie has been a serious blow to the University at large and, more especially, to the Faculty of Medicine and to the interests of public health in the city and throughout the country.

While it may be true that in the early years after his advent to McGill things medical were somewhat of a mystery, he soon acquired a very detailed knowledge of the needs of our Faculty, and, having sorted out the wheat from the chaff, cooperated on every occasion where the highest needs of the Medical School were demanded. The Faculty of Medicine was to him a source of pride. In respect to personnel, equipment and new departments, he was ever ready to lend a hand and press the issues before the governing boards of University and Hospitals. It is in this official capacity more particularly that we would record our sense of the loss that we have suffered.

Dr. John Beattie, Associate Professor of Anatomy in McGill University, has been appointed Conservator of the Hunterian Museum and Director of Research at the Royal College of Surgeons, London, and at the Buckston Browne Research Farm, in succession to Sir Arthur Keith who has retired.

Dr. Beattie graduated from Queen's College, Belfast, with the degree of M.B., Ch.B., in 1923 and later received the M.D. (1927) and D.Sc. (1929) from the same institution. From 1924 to 1927 he worked with Professor Elliot Smith as Research Assistant and Demonstrator of Anatomy at University College, London. In 1927 he was appointed Assistant Professor of Anatomy at McGill and was promoted to an Associate Professorship in 1930.

University of Toronto

The Council of the Faculty of Medicine of the University of Toronto, at its regular meeting on October 6, 1933,

RESOLVED:

That the occasion of the retirement of Prof. Frederic Newton Gisborne Starr from the University be marked by an expression of the high regard in which he is held by his colleagues in the Faculty and by an acknowledgment of the many services he has rendered to it as a teacher.

Professor Starr joined the Faculty in 1891, upon his return from post-graduate study in England, Germany and France. From then until 1900 he served as demonstrator in Surgery and in Anatomy at which time he was made Associate Professor of Clinical Surgery. In 1923 he became a Professor of Clinical Surgery and in June, 1933, Emeritus Professor.

His service as a teacher was continuous from 1891 to 1933, a period of forty-two years, with the exception of the time spent on military duty during the War. During that period he served with distinction as Major with the Royal Army Medical Corps in France. He was mentioned in despatches and after the armistice was created a Commander of the Military Division of the British Empire. His ripe experience and his energy and skill as a surgeon enabled him to render incomparable service to our troops.

As a member of the Faculty Council he was an enthusiast for the advancement of the school. His interest in its problems was general and not confined to his own department. His counsel was always welcomed.

His record as a teacher of Surgery indicates that he was more interested in teaching the craft as a master to apprentice than as a clinical or didactic lecturer. To the small groups of senior students, house surgeons and personal assistants about him, he was a teacher of the very highest order, as is amply demonstrated by the quality of the men he has trained.

It is as a craftsman, however, that he may justly claim the highest praise of this Faculty. No surgeon in his time in this country has reached greater distinction in the practice of his art nor has deserved

more justly the confidence of his patients. The number of the members of this Faculty who have consulted him in serious illness indicates the regard in which his skill and judgment are held.

While the Faculty Council cannot help regretting that the time of his retirement has arrived, it is glad to observe that this retirement indicates no dulling of his enthusiasm for his beloved art and no lessening in the rare skill with which he practises it. It extends to him its best wishes for his continued happiness and its hope that he may have many years to reflect on the wealth of surgical experience that he has enjoyed.

Special Correspondence

The Edinburgh Letter

(From our own Correspondent)

A sum of £20,000 has been given to the University of Glasgow by Miss M. D. Rankin, Greenock, to provide further funds for medical research. This benefaction carries on a tradition of wisdom and generosity to which Scotland owes a great deal. The Principal, Sir Robert S. Rait, in intimating the gift at a meeting of the University Court, stated that the generous gift was definitely for research work and not for teaching. Miss Rankin has expressed the wish that the claims of cancer research should be specially considered, but, apart from that, the money is to be available for the assistance of any kind of medical research into the origin and curative treatment of disease.

The subject of nutrition is one which is receiving a great deal of attention in these days. The report of a special committee appointed in April last by the Council of the British Medical Association, with the following terms of reference, has just been published, "To determine the minimum weekly expenditure on foodstuffs which must be incurred by families of varying size if health and working capacity are to be maintained, and to construct specimen diets." The report, which was published in the issue of the *British Medical Journal* of November 25, 1933, is also to be made available in pamphlet form and has been received with great interest.

The Departmental Committee on Scottish Health Services recently appointed by the Secretary of State "to review existing health services in the light of modern conditions and knowledge and to make recommendations on any changes in policy or organization that may be considered necessary for the promotion of efficiency and economy," is now engaged in the preliminary stages of the inquiry. This involves consideration of various social and economic factors, questions regarding population, birth and death rates, and the biological factors that have to be taken into account in working out a national health policy. After this preliminary work has been completed the Committee will proceed to review the environmental and sanitary services before proceeding to a detailed review of the existing medical services of the country.

The increased appreciation by the public of the facilities for treatment which only the fully equipped hospital affords is evidenced by the fact that additional accommodation is to be provided in the Victoria Infirmary, Glasgow, for patients who are prepared to pay for the treatment they receive in that institution. At the present time this is one of the few institutions in Scotland where provision is made for paying patients. There are, however, only two paying wards in that hospital with a total capacity of 32 beds. When this new extension is completed, the number will be increased to 82. Such a change in hospital policy is very much overdue. At present some voluntary hospitals are unable, by reason of the terms of their Charters, to charge fees for upkeep and treatment, and this difficulty will have to be overcome by application to the Court of Session or the Privy Council. There can be no doubt that in future increasing use will be made by all classes of the community of the services provided by the general hospitals of this country, at a scale of charges, in respect of both upkeep and treatment, appropriate to the financial position of the patient. In these days of financial stringency the income of the voluntary hospitals can no longer be dependent entirely upon the somewhat uncertain operations of charity, and whilst those persons who are unable to afford to pay fees will still be admitted to the hospitals without charge, those who are able to do so will be asked to pay reasonable fees for the services provided. For the working classes provision will doubtless be made for this by the establishment of what are known as contributory schemes. These schemes provide what is in effect a voluntary form of insurance against the cost involved by admission to hospital.

The social activities of the British Medical Association are in full swing just now. Recently, the Edinburgh Branch of the Association held their Annual Reception and Dance in the Scottish House of the Association in Edinburgh. The guests were received by Dr. Easterbrook, the President of the Branch, and an enjoyable dance followed.

The Glasgow Panel Committee also held their Annual Dinner and Dance in the Grosvenor Restaurant, Glasgow. About two hundred and eighty persons were present. Dr. Lambie, the Chairman, presided at the dinner. In the course of the evening a competition took place as to which couple danced the old fashioned waltz best. After several eliminating trials the prize was awarded to Dr. Scott, of Glasgow, who was partnered by his mother.

R. W. CRAIG.

Edinburgh.

The London Letter

(From our own Correspondent)

The reports of the chief medical officers to the Ministry of Health and to the Board of Education have both emphasized the fact that there is as yet no widespread malnutrition among the children in the country, although there is the danger that this may only be effected through semi-starvation on the part of the mother. Other investigations have not expressed so rosy a view of the position, and it is an appropriate moment for the British Medical Association to issue the report of its "Committee on Nutrition," appointed earlier in the year to inquire into the cost of a minimum diet. Taking as a basis 3,400 calories for the adult man doing very little in the way of manual labour, allowing an adequate amount of first-class protein, minerals and vitamins, the committee has been able to construct a bare minimum diet at a cost of nearly five shillings a week per man-value, and with a little allowance for variety at a cost of about six shillings per week. The wife and children of a family have been taken at varying percentages of this man-value, but while, in theory, a young child may require only about 30 per cent in calories as compared with the adult man, in practice the cost is nearly 50 per cent because of the necessity of adequate milk at this age-period. The difficulty in ascertaining the actual costs of articles of food has been successfully overcome by the help of reports from medical officers of health in various representative areas, who secured an average price for more than fifty foods in the course of a fortnight in the summer. The specimen diets given in the report give the actual amounts of food in the usual pounds and pints, and while to the unemployed man or woman there is room for a cynical laugh at what one paper describes as "scraps of cod" the committee must be congratulated on solving what was set them, namely "the cost of a minimum diet." Allowance is made for fruit, vegetables, and dairy products daily, and it should be easily possible for the authorities to see that the money paid out in "assistance" is adequate to purchase at least such a diet after rent etc. has been met.

Mention has been made before in these notes of the attempts being made in this country to view crime as a disease rather than as an excuse for ill-directed punishment. There is, of course, a danger in any community of carrying this too far, but at present the danger is all the other way. It was therefore gratifying that at the recent annual meeting of the Magistrates' Association, held in London, certain representatives of the medical profession were allowed to address the audience on psychology and delinquency. Dr. R. D. Gillespie pleaded for a scientific study of the delinquent, and another psychologist begged the magistrates to accept the willing help of medical men and women in the investigation of the why and wherefore when respectable and experienced men and women suddenly fall into criminal ways. At a later meeting dealing with the same subject the telling point was made that while a successful suicide was so often classified as "insane", an unsuccessful effort usually meant criminal proceedings. Under the new "Children and Young Persons Act," which has just come into force, the justices of each area are to set up special juvenile courts, but compulsory examination by a psychiatrist is not provided for, and, indeed, the Home Office circular dismisses the medical aspects of the matter in five lines. Nevertheless, there is a growing body of public opinion in favour of a closer study of the psychological aspect of crime, which is especially welcome in view of the probable increase in juvenile delinquency in the course of the next few years.

A further step towards solving the problem of the medical aspects of the motor-car accidents has recently been taken, it being assumed nowadays that the other aspects, including prevention, are well-nigh insoluble. The new "Road and Rail Traffic Act" (now passed) includes a clause providing that hospitals shall be paid expenses reasonably incurred by them in the treatment of motor accident cases. For each in-patient the amount is not to exceed £50 and in the case of an out-patient £5. It is estimated that the cost to hospitals of treating accidents is in the nature of a quarter of a million pounds a year of which only about one-eighth is recovered. Another possible measure is still under consideration in Parliament, but it is being suggested that under Lord Moynihan's "Road Traffic (Emergency Treatment) Bill" a standard rate of 12s. 6d. (10s. 6d. fee, plus an allowance for drugs and dressings) and 6d. per mile over two which the doctor has to travel to deal with an accident. It is proposed that this shall be paid by the insurance companies out of an extra shilling per car added to the compulsory insurance premium for "third party" risks. The sum mentioned does not sound very much, but many a doctor has been attending accident cases for years without any sort of financial return, so that, philosophically, he may well regard the fixed rate as a certain something in the place of the customary nothing.

ALAN MONCRIEFF.

London.

Topics of Current Interest

The Medical Service and National Defence

Many of us give lip service to cooperation and repeatedly stress the necessity to regard each arm and service as a part of the whole military organization, requiring the effective cooperation of the remaining parts to enable each to function in an efficient manner. At the same time, we like to point out that the functioning of the military organization as a whole is dependent on the effective working of its component parts. Yet, in spite of the truth contained in these generalizations, many of us are inclined to limit our horizon to the "G" end of cooperation and are apt to neglect its essential application to the "Services".

It is dangerous to dogmatize regarding the respective importance either of the arms or of the services, but when we realize, irrespective of the degree to which mechanization may be adopted, that mere man remains the most valuable element within the military organization and that the primary function of the Medical Service in war is the conservation of manpower, we can see that a high degree of priority must be given to the war task of this service.

The successful accomplishment of that task requires consideration in three fields; the first pertains to the procurement of the necessary numbers of trained medical officers and assistants; the second calls for the military training of that personnel and their grouping into military units of such a type as will enable the service best to carry out its function in war; and the last deals with the tactical employment of those units in war.

The first factor, namely, the procurement of officer personnel, in so far as it affects Canada, is dealt with elsewhere in this number by Major E. S. Jeffrey, M.C., in his paper, "The Responsibility of the Canadian Medical Profession in National Defence".* The second and third factors, though not fully developed, are expressed by Major Jeffrey, when he stresses the necessity of military training for the civilian doctor and when he states that, "all the physicians and surgeons are of no use if we can not get the wounded to them and in decent shape."

The above extract gets down to the roots of one of the organizational problems facing the Medical Service; *i.e.*, in view of the probable extensive use of armoured fighting vehicles and aircraft in a major war of the future, and of the general increase in the mobility of the fighting arms, how are the wounded to be collected and brought to the medical officer?

The use of armoured fighting vehicles, particularly when used independently and not in cooperation with the other arms, presents a new problem in the collection and evacuation of casualties. The nearest approach to the problem is that of collecting casualties from a cavalry formation. This task is, at present, entrusted to a cavalry field ambulance which would mobilize on a basis of one per cavalry brigade. The unit is motorized and is highly mobile. It contains a headquarters, which is capable of forming a main dressing station, and four small but highly mobile sections. Each section consists of a light lorry to carry medical equipment and personnel, a medical officer in a light car and a motor cyclist for purposes of intercommunication. Each of these sections is capable of forming an advanced dressing station, where wounded are collected from regimental aid posts or points indicated by the regimental medical officer. There are twelve 6-wheeled motor ambulance cars with the headquarters of the unit for the purpose of clearing from A.D.S. to M.D.S.

Such a unit by virtue of its mobility is theoretically suitable for employment with formations endowed with greater mobility than that of a cavalry brigade, but from the practical viewpoint, such a unit does not solve entirely the question of the collection of casualties in an operation carried out by an armoured brigade. It is understood that present arrangements in Great Britain call for the inclusion of a motorized (Cavalry) Field Ambulance with an armoured brigade and that this medical unit will accompany the "B", or administrative echelon of that formation. Presumably the M.D.S. would open, in the first place, at the initial location of "B" echelon, and A.D.S's at the successive bounds or rallying points of the fighting portions of the brigade. Because, however, of the wide frontage and depth occupied by the fighting elements of the brigade, it is difficult to see how the wounded are to be collected and brought to the A.D.S. unless ambulance cars are provided for that purpose. It would seem doubtful if the present allowance of 12 cars, clearing to M.D.S., would permit of a sufficient number being available to work in advance of A.D.S.

We have only touched upon the fringe of the problem which increased fighting mobility has imposed on the Medical Service. The one conclusion that is generally accepted is that the mobility of medical units in the field must be increased. The motorization of the Cavalry Field Ambulance is the first gesture in this direction and it is likely to be followed by a

* *Canadian Defence Quarterly*, 1933, **11**: 64. This article also appeared in the *Canad. M. Ass. J.*, 1933, **29**: 195.

somewhat similar organization for the Field Ambulance and some measure of mobility given to that notoriously immobile unit, the Casualty Clearing Station.

This organizational problem is vital to the work of the Medical Service in war, because, irrespective of the professional standing of the medical personnel, their work can accomplish little unless backed up by an effective and smooth system for the collection, rapid evacuation and suitable accommodation of casualties. The successful attainment of this end can not be reached by the medical officer alone; it demands cooperation of the highest order between all parts of the military organization and particularly between the Staff and the Medical Service. On the part of the Staff it requires an understanding of medical problems and an appreciation of the influence which an effective medical organization can exert on the successful prosecution of a campaign. On the part of the Medical Service it demands, in addition to professional attainments, a wide and detailed knowledge not only of military organization and of the difficulties of movement and maintenance common to the army as a whole, but of the functions, the capabilities and the limitations of each of the arms and the other Services.

But this knowledge required by the medical officer, as so truthfully pointed out by Major Jeffrey, can only be attained in times of peace. Consequently, if through the agency of the "Section of Military Medicine," the civilian members of the Canadian Medical Association can acquire some measure of familiarity with general military questions and the medical problems arising from them, then a great step forward will have been accomplished.

The effect of such a progressive move should react favourably not only on the peace time activities of the Canadian Army Medical Corps but, of even greater importance, if the Canadian Medical Association accepts Major Jeffrey's resolution, together with its implication that the Association is responsible for meeting the demands of the Medical Service on mobilization, then the preliminary purpose of those who were responsible for the formation of the military section will have been attained. The ultimate success of the affiliation depends, however, upon the creation and the maintenance of the interest of the parent body in the activities and the problems of its youngest off-spring. To generate and foster that interest would now seem to be the chief task of the "Section of Military Medicine."

Just as in war the Medical Service must look to the Staff for assistance, so in this important peace time task it would be justified, and, we trust not disappointed, in looking for cooperation from the same quarter.—Editorial, *Canadian Defence Quarterly*, 1933, **11**: 5.

Abstracts from Current Literature

Medicine

Pernicious Anæmia without Achlorhydria. Harvey, E. A. and Murphy, W. P., *Ann. Int. Med.*, 1933, **6**: 1393.

Achlorhydria is usually considered to be a permanent condition in pernicious anæmia, even after a good remission has been brought about by liver treatment. The occasional case has been reported, however, in which free hydrochloric acid returned to the stomach after a remission. Several observers have reported the occasional case of a disease condition typical of pernicious anæmia in all essential respects, except that free hydrochloric acid was present in the gastric secretion. The authors report such a case, giving the laboratory and clinical findings in considerable detail. The blood responded quickly and in a typical manner to the oral administration of liver, and later to the intramuscular injection of liver extract, when, on account of diarrhœa and the poor absorption of liver and liver extract given by mouth, a relapse had occurred. The patient suffered from chronic cholecystitis and cholelithiasis, and had a diffuse perihepatitis, as noted at operation. These seemed to have a retarding influence on the efficacy of the liver therapy. When the patient came to autopsy, the findings were typical of pernicious anæmia.

The authors state that in view of the inconstancy of the achlorhydria, disturbances in the biliary system or the liver may sometimes be of even more immediate etiological importance than the gastric changes.

H. GODFREY BIRD

Migraine. Some considerations of Allergy as a Factor in Familial Recurrent Headache. Rinkel, H. J., *J. of Allergy*, 1933, **4**: 303.

In this paper the term "migraine" is used to mean (1) attacks of headache with cortical features, *i.e.*, scintillating scotomata, homologous hemianopsia, motor aphasia, and paræsthesias; and (2) recurrent paroxysmal headaches familial in nature and for which no organic cause can be found. Analysis of the history and symptomatology of a series of cases of migraine (number not stated) did not reveal any definite findings by which a diagnosis of migraine due to allergy could be established. This could only be done by clinical trial, but was thought most probable in those patients with early onset, frequent irregular attacks, and a family history of headaches. The author notes that the precipitation of migraine by the ingestion of certain foods does not prove allergy to be the mechanism of symptom production in these cases. But the

individual must be proved allergic, and the mechanism must be shown to be the same as that of hay fever and bronchial asthma. However, he finds allergic therapy a decidedly useful procedure in many cases with recurrent headache, familial in nature.

T. G. HEATON

Un Cas D'Urticaire Profonde compliquée de Paralysie du Plexus Brachiale. Mathieu, E., *L'Union Méd. du Canada,* 1932, **61**: 377.

The author reports a case of sudden coma with stertorous breathing and urticaria in a previously healthy man of 34 years of age. On gradual recovery from coma a complete paralysis of the right arm was noted, with absent reflexes and marked hyperæsthesia. Recovery from the paralysis was prolonged over several months. The author notes the occurrence of similar cases reported in the literature, following serum therapy. In these cases paralysis occurs during attacks of serum sickness and the right arm is usually the seat of the paralysis, especially the muscles supplied by the circumflex nerve. The duration of the paralysis in such cases is from three to six months. It is necessary to distinguish this type of paralysis from that due to the toxin of the diphtheria bacillus.

T. G. HEATON

Surgery

Preserved Fascia in Hernia Repair. Koontz, A. R., *Arch. Surg.,* 1933, **26**: 500.

In recent years autogenous fascia lata has been employed in the repair of hernial defects. Such transplants persist as living tissues and become incorporated into the tissues among which they are transplanted as an integral part of the organism. Several years ago, the author showed that animal fascia preserved in alcohol may be used in exactly the same way as living fascia, taken from the thigh of the patient that is being operated on. The underlying principles in the use of alcohol-preserved animal fascia are explained. Since the publication of the author's first work on dead fascia grafts, strips of alcohol-preserved fascia have come to be widely used in the repair of hernia defects, and in other operations, such as those for habitual dislocation of the shoulder, repair of the sphincter, cases of fæcal incontinence, and open reduction of fractures, etc. The author uses the alcohol-preserved fascia from the ox. He has used it in 85 operations for hernias of all sorts. Many of these were difficult cases. He had only three recurrences. Koontz follows Gallie's technique in operating for post-operative hernia, substituting his alcohol-preserved ox fascia for Gallie's living sutures.

G. E. LEARMONTH

Traumatic Osteomyelitis of the Cranial Vault. Adelstein, L. J. and Courville, C. B., *Arch. Surg.,* 1933, **26**: 539.

The authors report the case histories of 6 patients with various clinical types of traumatic osteomyelitis of the cranial vault, in a series of more than 5000 cases of head injuries, on the Neurological Service of the Los Angeles Country General Hospital. They ascribe the present relative rarity of infections of the bones of the head to the modern prompt and careful treatment of superficial wounds, which tend to heal if given an opportunity. The natural local defense which prevents the ingress of infection when the bone has been exposed to injury is the firmness and thickness of the outer table. Because of this factor, osteomyelitis of the skull would undoubtedly be of common occurrence in injuries in which the subaponeurotic space has been opened and infected.

Infection of the bone may be introduced by the traumatic agent or from infected hair follicles in local bruises, with or without open wounds. In closed wounds it may occasionally be blood-borne. A common mode of invasion is the development of frank infection in a compound comminuted fracture of the skull, either immediately or after a latent interval.

The authors classify cranial-vault osteomyelitis under: (1) localized; (2) spreading; (3) infective necrosis of fragments in comminuted skull fracture.

Extradural abscess is the most common intracranial complication, and is characteristically seen in localized osteitis of the skull. The accumulation of pus is the result of a downward spread of the infection through the inner table. The abscess is usually evacuated spontaneously by dissolution of the overlying bone, but it may be necessary to trephine and drain. Radical surgical intervention has but little place in the treatment of traumatic osteomyelitis of the skull. The prevention of this disease is of first importance, and there should be careful handling and thorough débridement of the wounds in cases where there are compound fractures with in-driven fragments of bone and débris from the street. Balsam of Peru is applied daily to the wound and this drug has been of distinct value in the author's experience, as it favours the subsidence of infection and the development of granulation tissue. Surgical intervention is limited to the removal of sequestra that cannot be discharged through draining sinuses.

G. E. LEARMONTH

Obstetrics and Gynæcology

Genital Function and Sport. Küstner, H., *Münch. med. Wchnschr.*, 1933, **80**: 132.

In the modern enthusiasm for sport, physical culture, and their physical and moral advantages, certain deterrent influences should be considered. In this regard some have warned against the tendency of masculinization of the female body which so often follows systematic athletic training during the growth period. One authority has claimed that among the female workers in the textile industry the posture and movements necessary for the operation of the machines predisposes toward flattening of the pelvis; another has described the future athletic woman and claims that she will be short-trunked and long-limbed with broad shoulders and narrow hips. The author is especially interested in the prevalence of menstrual and associated disorders of the genital tract so common among female athletes. He has observed in a number of cases that prolonged athletic training seems to produce an irregularity and diminution of the menses which often amounts to an amenorrhœa. In some cases a uterine hypoplasia may be found, and it is possible that this may be an indication of diminished sexual function and decrease of fecundity. The cause of these alterations is probably hormonal. The secretion of the sex glands may be decreased as a result of the changes consequent to immoderate exercise. Also, it is possible that such effects may be brought about by the constant influence of ultra-violet radiation so common in an athletic regime. The author urges that these matters be seriously considered in the organization of feminine athletics, and suggests that all medical men who have the opportunity should make careful observations on cases of this kind when circumstances permit, in the hope that a more accurate rationale may be laid down for educational athletic programs.

LALL G. MONTGOMERY

Nephritis in Pregnancy. Stander, H. J., *Am. J. Obst. & Gyn.*, 1933, **26**: 183.

The prognosis in chronic nephritis complicated by pregnancy is grave, the average maternal mortality occurring within ten years being approximately 40 per cent. The strain of pregnancy on the kidney function greatly aggravates an underlying chronic nephritis and thereby materially shortens the life of the individual. The urea clearance and fifteen-minute phenolsulphonephthalein tests are advocated to help in the early recognition of nephritis. The creatinine excretion test may also be employed, although it perhaps measures tubular instead of glomerular function. In addition to these kidney function tests, the patient's past history, the duration of the pregnancy, the behaviour of the blood pressure, albuminuria, and œdema under hospitalization with proper dietary measures, the examination of the eyegrounds, the cardio-vascular system, and the findings in the blood and urine chemistry, are all aids in establishing a correct diagnosis. The best treatment for chronic nephritis in a pregnant woman is termination of the pregnancy and prevention of any further pregnancies.

ROSS MITCHELL

Post-natal Loss of Weight in the Newborn. Kugelmass, I. N., Berggren, R. E. L. and Cummings, M. A., *Am. J. Obst. & Gyn.*, 1933, **26**: 375.

The initial loss of weight in the newborn can be prevented by the administration of a solution consisting of 6 per cent gelatin (pH 6.2), 3 per cent dextrose, and 0.5 per cent sodium chloride at two-hour intervals throughout the twenty-four-hour cycle immediately after birth. The gelatin hydrates blood and tissues; it raises body heat by virtue of its specific dynamic action; and reduces the clotting time. Dextrose brings the newborn hypoglycæmia to normal. Sodium chloride raises the initial low blood chloride and favours hydration. The average loss of weight in newborn infants receiving the hydrating solution was 1.7 per cent, the irreducible minimum, in comparison with the average loss of 7 per cent. The characteristic clinical picture of the newborn is a result of birth shock, more effectively combated by a hydrating solution than by milk mixtures during the first two or three days of life.

ROSS MITCHELL

Urology

Tuberculous Nephritis and Tuberculous Bacilluria. Lieberthal, A. and Huth, T., *J. Urol.*, 1933, **30**: 153.

The question is raised as to whether or not a normal kidney may excrete tubercle bacilli. While some authors hold that it may do so in exactly the same manner as it excretes dissolved substances from the blood, others assume that only a kidney previously damaged by degenerative changes or trauma becomes permeable, so to speak, to tubercle bacilli. A third group assumes that tubercle bacilli, by their local action on the renal tissue, can produce simple inflammatory changes without giving rise to the formation of tubercles or any other typical lesions of tuberculous infection, and such changes may serve as the source of the tubercle bacilli which appear in the urine. In this way the term tuberculous nephritis has arisen, and it defines a variety of pathological changes which are all said to be due to the action of the tubercle bacillus or its toxins upon the renal tissues.

This study was undertaken to clear up some of these questions, and covers the clinical histories and findings of 1000 cases of renal tuberculosis, together with a minutely detailed study of 240 specimens of tuberculous kidneys. Several cases are reported in detail. From these studies the writers conclude that in every case of so-called tuberculous nephritis there is a definite tuberculous focus in the kidney which is not found because the kidneys were not examined with sufficient care. They outline a definite system of routine examination, and they point out that if such a searching examination is not made these foci will be missed even by experienced pathologists. The focus which disseminates the organisms into the urine is always a caseous ulcer which is in communication with the renal pelvis. This ulcer usually lies upon a renal papilla and in its caseous centre numerous tubercle bacilli are always demonstrable. In the renal tissue in the vicinity of these lesions chronic inflammatory changes are usually demonstrable, but not tubercle bacilli.

While some authors maintain that the presence of pyuria, tuberculous bacilluria, and a functional defect are necessary for the definite diagnosis of renal tuberculosis, others believe that the demonstration of pus and the bacilli suffices; but the authors are convinced that tubercle bacilli alone in the absence of other defects indicates the presence of a tuberculosis focus in the kidney, and that if such a focus is not found it is because it is not sufficiently carefully looked for. Similarly in those cases where there is a definite disease of one kidney, and where the apparently good side is supposed to secrete bacilli due to the presence of a tuberculous nephritis, the authors are of the opinion, and cite cases in proof, that an incipient ulcerative lesion is certain to exist.

While renal tuberculosis is clinically unilateral in many cases, it is likely to be bilateral from a pathological point of view, the lesions in the second kidney being so small as to be overlooked. In those cases in which the authors were able to study the apparently normal kidney at autopsy small foci were found on careful examination. They believe that such lesions may heal, and that these cases may be responsible for the transient tuberculous bacillurias that are sometimes seen.

N. E. BERRY

Ophthalmology

The Normal Ocular Tension Among Chinese. Pao-Hua, L., *National Med. J. of China,* 1932, **18**: 957.

Measurements with the tonometer were made of 420 eyes of normal ocular tension. The highest normal tension was 33 hgmm. and the lowest 13 hgmm. Although the highest normal intraocular tension among the Chinese is the same as that of European and American countries, the lowest figure is much lower; this finding, however, is similar to that of Gjessing. The average of this finding is 4 hgmm. lower than that of European and American authors.

S. HANFORD MCKEE

Statistical Study on Trachoma in the Branch Schools of the Peiping Normal University. Chang, S. P., *Nat. Med. J. of China,* 1932, **18**: 958.

Among 2,528 students examined, 456 were found suffering from trachoma, that is 12 per cent. Among 1,247 males examined 19.7 per cent suffered from trachoma, while among 1,281 females the percentage was 16.4. The percentage in regard to age showed that the chances of contagion increased with age. Under 10 years the percentage was 7.2, while above 10 years it was 28.9. Of the forms of trachoma, the papillary was predominant, and the cicatricial least seen.

S. HANFORD MCKEE

The Contagiousness of Trachoma: Three new Cases of Direct Contagion: Physicians infected by their Patients following Operative Accidents. *Ann. d'Ocul.,* 1933, **170**: 78.

In view of the present tendency to regard trachoma as less contagious than formerly the following report at the Ophthalmological Society of Paris, October, 1932, is of interest. Cuenod and Nataf, of Tunis, reported there the accidental inoculation of three of their confrères with trachoma in identically the same manner, in the course of operative procedures, that is, after the accidental entry of trachomatous material in their eyes. These three cases constitute real laboratory experiences, and bring three new cases of direct absolutely indisputable contagion to our notice. In comment Morax stated that these accidental inoculations, because they were real experiences, were of great interest.

S. HANFORD MCKEE

Neurology and Psychiatry

The Mental Symptoms associated with Fifty-eight cases of Cerebral Tumour. Minski, L., *J. Neurol. & Psychopath.,* 1933, **13**: 330.

Out of 58 cases of brain tumour which displayed mental symptoms 25 showed reactions simulating neurosis. In 12 of the total cases there were no abnormal physical signs, and in only 22 were there localizing signs of tumour.

Mental symptoms are most commonly found in left-sided cerebral tumours. The character of these mental symptoms does not appear to depend on localization, but rather on the rate of growth of the tumour and the previous personality of the patient. In slow-growing

tumours personality changes predominate, the mood depending on the release of pre-formed tendencies. In rapidly growing tumours changes in the intellectual sphere with clouded consciousness are marked and personality changes slight.

FRANK A. TURNBULL

Hour-glass Tumours of the Spine. Naffziger, H. C. and Brown, H. A., *Arch. of Neurol. & Psychiat.*, 1933, **29**: 561.

These tumours have an intraspinal portion connected by a small neck with an extraspinal enlargement. The communication is most frequently through an intervertebral foramen. They occur with such frequency in patients with compression of the spinal cord from a tumour that the possibility of hour-glass tumour must always be considered. The authors include reports of 15 cases.

The character and nature of many of the hour-glass tumours are such that an extension of the operation or a second-stage operation will often permit complete removal of the extravertebral portion as well as the intraspinal portion. The majority are benign. In the neck careful palpation may reveal an extravertebral mass. In the dorsal and lumbar regions as well as in the cervical region diagnosis is aided by roentgenograms, which should include views of the intervertebral foraminæ and the interlaminal and interspinous spaces.

FRANK A. TURNBULL

Dermatology

Ragweed Dermatitis. Pascher F. and Sulzberger, M.B., *Arch. Dermat. & Syphil.*, 1933, **28**: 224.

Although it is widely recognized that pollens may cause hay fever or asthma, it is not generally known that plant pollens may cause a dermatitis. Two cases of ragweed dermatitis are reported and a considerable number of tests have been done on each patient. The "pollen oil" is the element of the pollen which is usually regarded as the cause of a dermatitis, but this is not necessarily the case. From the results of testing with commercial pollen antigens and with protein-free ragweed pollen oil, the authors were able to determine that in the cases presented the oil fragment was the offender. The interesting comment is made that patients with only eczematous reactions and without the immediate wheal type of hypersensitivity possess no reagins. That is, patients who do not react to the scratch test, but who do react to the contact test with the offending pollen, have no antibodies in their blood capable of being transferred in the blood serum and causing a positive Prausnitz-Kustner reaction.

NORMAN M. WRONG

Dermatitis caused by Ethyl Gasoline. Johnson, D. W., *Arch. Dermat. & Syphil.*, 1933, **28**: 174.

The history is reported of a man who developed an urticarial eruption a few hours following exposure to ethyl gasoline. Over a period of five years he had about ten recurrences of this eruption, and each time he had been in contact with ethyl gasoline. Contact or patch tests were done on his skin. The various substances with which he came in contact at work, kerosene and plain gasoline, were used as controls. The only substance to which the patient reacted was ethyl gasoline, and the less the dilution, the greater was the reaction. The comment is made that there must be many more similar cases in existence which have not been reported.

NORMAN M. WRONG

Skin Diseases in the New World. Pardo-Castello, V., *Arch. Dermat. & Syphil.*, 1933, **28**: 22.

From the pen of this Cuban dermatologist we have a most interesting discussion of the writings of Oviedo, who was a contemporary of Columbus. Oviedo lived in the New World for forty-three years and wrote "A History of the Indies." He speaks at length of the "chigoes" or chigo-itch and of the "buas" or syphilis, as both being prevalent in the Indies of 1492. He tells how the latter spread to Spain and later to Italy and France through the armies of these countries. In view of the controversy as to the origin of syphilis the translation of the writings of Oviedo seem to be of particular value. The treatment by guaiac is discussed, as are also the modes of transmission. The opinion was that the disease could be transmitted by the wearing of contaminated clothes, the using of contaminated eating utensils, and by sexual intercourse. Oviedo also speaks of dermatitis venenata due to various plants common in the Indies, and of the large and foul type of warts found among the inhabitants of Peru which are known to-day as Peruvian warts. The powers of observation and description of this sixteenth century Spaniard have been made the subject of an all too brief paper.

NORMAN M. WRONG

Therapeutics

Serum Therapy in Poliomyelitis. Macnamara, J., *Brit. M. J.*, 1933, **1**: 526.

Serum therapy in poliomyelitis is handicapped by the difficulties of standardization. There are many variables, some reducible with care, others uncontrollable. Consequently more is demanded of the doctor responsible for the treatment of patients than the mere inoculation of the serum in the dosage written on the container; the response of the patient must be watched. The initial dose to be aimed at should be adequate to cause lowering of temperature

and improvement in the general condition; it should be ensured by continued observation that the necessity for a second or third dose may be recognized. From observation of one patient the approximate dose for the next should be estimated. Relatively larger doses should be used when a new batch of serum is employed. As with diphtheria antitoxin, it is the early and sufficient dose which is important; the size of the individual must always be considered. It has been shown that intravenous antitoxin passes into the tissue fluids four times as rapidly as that given intramuscularly and ten times as rapidly as that given subcutaneously. Particularly large doses of serum are required in fulminating cases, where general symptoms are closely followed by the spine sign and tremor.

An adequately controlled test of serum therapy has never been carried out. In New York, 1931, the untreated group consisted of much milder cases than those in the treated group. It was there shown however that many patients recovered without treatment, although a spine sign and cerebrospinal fluid changes were observed. In this epidemic it was shown, too, that a variable product, used in variable conditions, in arbitrary dosages, was followed by a percentage of failures—3.8 per cent mortality; 19.6 per cent paralysis, and 7.7 per cent "weakness". In a smaller series, Kramer and Aycock report that 5 of their treated cases developed severe paralysis; they suggest that this was due to the lateness of the treatment. Good results have been reported both from Chicago and Brisbane.

Statistics which will give a clear picture of the value of the serum will remain unobtainable as long as uniform standard units of serum and of virus are wanting. In New Zealand, Canada, Australia and United States, experience has led many workers to consider human immune serum of value in promoting prompt recovery and protecting from severe paralysis. It must be realized that clinicians must assume the added responsibility of judging the dosage, a responsibility reduced in the use of other serums by laboratory standardization. The observation of each patient, the study of the temperature chart, and experience with the disease and with the serum available, tend to make the estimation of the necessary dosage more accurate.

W. FORD CONNELL

The Treatment of Poliomyelitis by the Transfusion of Blood from Convalescents. Schottmüller, Von, *Deutsch. med. Wchnschr.*, 1933, **59**: 43.

Massive blood transfusion is claimed to be much superior to the injection of so-called "convalescent serum" in the treatment of acute poliomyelitis. One of its chief values is the ease and rapidity with which the treatment may be instituted. Convalescent serum is often difficult to obtain in sufficient amounts, and its careful preparation usually requires at least twenty-four hours. On the other hand, blood transfusion may be carried out immediately and very large amounts of blood are easily obtained. Intravenous therapy has a much more rapid effect than is the case when the immunizing substance is injected by some other route, as in the case of serum therapy. Furthermore whole blood seems to contain more active antibodies than does the serum alone.

LALL G. MONTGOMERY

The Use of Pyridium in Obstetrics and Gynæcology. Marion, D. and Magnan, L. A., *l'Union Médicale du Canada*, 1932, **61**: 1061.

Pyridium is a chemical compound of pyridin salts, used by the authors for over a year with the following results. In the treatment of gonococcal infections, urethritis, vaginitis and cervicitis, and in cases of cervicitis with and without erosion, cures were obtained in 107 cases out of 203 treated, and marked improvement in the remainder. In old cases of endocervicitis, endometritis and salpingo-ovaritis 6 out of the 20 cases treated were cured, the remainder being improved. In generalized old or recent gonococcal or puerperal infections of the genito-urinary tract only 3 cases were improved out of the 7 treated, while the remaining 4 were unaffected by the treatment. In the pyelonephritis of pregnancy 16 cases were treated, out of which 11 were cured, 3 improved and 2 unimproved. Cases of *Trichomonas vaginalis* vaginitis showed improvement under treatment, but it was impossible to destroy the parasite with this medication.

The pyridium is used in the form of tablets by the mouth, a 1 per cent solution for douches, a 3 per cent ointment for application to the vagina and cervix, and as suppositories. Pyridium is used in addition to the usual general treatment of rest in bed, etc., by the vaginal injection of 1 litre of tepid boiled water containing 1 tablespoonful of a 1 per cent pyridium solution, by the insertion of pyridium suppositories and tampons of 3 per cent pyridium ointment on alternate days, and by the oral administration of pyridium tablets twice a day. In post-partum cervicitis and *Trichomonas* vaginitis daily irrigations of the parts by Dakin's solution are recommended in addition. The authors have also found that drains soaked in pyridium, 1 per cent, were helpful in 2 cases of breast abscesses and 3 of perineal wounds.

GUY H. FISK

Hygiene and Public Health

Zinc in Relation to General and Industrial Hygiene. Drinker, C. K. and Fairhall, L. T., *Pub. Health Rep.*, 1933, **48**: 955.

In 1925 a publication of the United States Public Health Service placed a limit on zinc of 5 parts per million in drinking water. The zinc ion is not poisonous in itself, but becomes irritating when combined with other elements, such as when in the form of salts like the chloride, sulphate, acetate or tartrate. Even the salts, however, appear to affect individuals by their local irritating action and not as systemic poisons, such as the salts of lead or antimony. It would appear, therefore, that the limit of 5 parts per milliom is unnecessarily low. It is suggested that no limit need be set since so far as drinking water is concerned; taste is a satisfactory indication of an undesirable concentration. In view of the irritating action of many of the salts of zinc, foods or beverages should not be stored in galvanized vessels.

Industrially, zinc produces the well known "zinc chill" or "brass founders ague." This is not a specific action of zinc since other metals in the same fine degree of subdivision will produce a similar phenomenon, nor can it be considered exactly as a poisonous effect since it is due to the physical state of the metal—*i.e.*, its fine subdivision.

FRANK G. PEDLEY

Sand and Metallic Abrasive Blasting as an Industrial Health Hazard. Bloomfield, J. J. and Greenburg, L., *J. Indust. Hygiene,* 1933, **15**: 184.

Studies on silicosis dust suggest that air containing more than 10 million particles per cubic foot of granite dust, or 6 million particles per cubic foot of quartz dust, is hazardous if breathed over any considerable period of time. The study here reported was made for the purpose of appraising the hazard in sand-blasting practice.

Detailed studies were made in some 28 shops using various types of sand-blasting equipment. The measurement of the size of the dust particles indicated that practically all those recovered from the air were less than 5 microns in diameter (Particles less than 10 microns in diameter are considered the most dangerous size). The quartz content of the dust when sand alone was used varied from 42 to 98 per cent. When sand and metal mixtures were employed the atmospheric dust averaged 44 per cent quartz, and when metal abrasive only was used 3 per cent. With sand abrasive the average dust concentrations to which workers were exposed varied from 241 million particles per cubic foot under helmets with no positive pressure, to 3 in cabinets. Under helmets with positive pressure the average dust concentration was 4.7. In the work room itself the average concentration was 49 million particles per cubic foot.

This study indicates a very evident hazard which requires control both by the use of general ventilating equipment and by means of masks or helmets, preferably by the positive pressure type.

FRANK G. PEDLEY

Pathology and Experimental Medicine

Blood Phosphatase and the Van den Bergh Reaction in the Differentiation of the several types of Jaundice. Roberts, W. M., *Brit. M. J.*, 1933, **1**: 734.

The author here presents the results of the chemical investigation of 52 cases of jaundice, of all types; in all but 7 of these the diagnosis was evident, either clinically or at post-mortem. The author criticizes the usually described method of performing the van den Bergh test, direct and biphasic, and suggests modifications. A perusal of the results in these cases bears out his claim, however, that this test alone is quite unreliable in distinguishing obstructive cases on the one hand from catarrhal, toxic and infective jaundice on the other. Having noted in 1930 several cases of obstructive jaundice showing very high blood phosphatase figures, the author has carried out this test in the present series. It is shown very strikingly that the phosphatase figure is high above the normal in the obstructive group, while it is only slightly raised or quite normal in the other types. This test, then, it is claimed, constitutes a reliable method of differentiating obstructive from other jaundice.

A modification of the present views of bile-pigment formation and excretion is also suggested. It is usual to postulate that the indirect-reaction pigment (of the van den Bergh test), formed in the reticulo-endothelial system, is taken up by the polygonal cells of the liver and there converted to the direct-reaction pigment; the author would have it that the transformation to direct-reaction pigment occurs in the blood in, or even outside, the liver, so that the function of the polygonal cells is simply to transfer the direct-reaction pigment from the blood to the bile. This would explain the frequent occurrence of a direct reaction in toxic or catarrhal jaundice, and also the fact that Mann has found, six hours after hepatectomy in dogs, the blood showing, first, an indirect, and later a biphasic van den Bergh reaction. The significance of the high blood phosphatase is also considered in detail. The blood phosphatase may fail to elucidate the nature of the jaundice when the latter is very slight, or in such cases, as Graves' disease, in

which the blood phosphatase is already high before the onset of the jaundice.

W. FORD CONNELL

The Etiology of Pernicious Anæmia and Related Macrocytic Anæmias. Castle, W. B., *Ann. Int. Med.*, 1933, 7: 2.

Addisonian pernicious anæmia is a deficiency disease conditioned by the lack of a specific intrinsic factor in the gastric juice. This intrinsic factor is heat labile, and does not correspond in its properties to hydrochloric acid, pepsin, rennin or lipase. In the normal individual its function is to interact with an extrinsic factor in the food to produce hæmatopoietic effects. In general, the characteristics and distribution of the extrinsic factor correspond to those of vitamin B_2.

Sprue with macrocytic anæmia and the macrocytic anæmia of cœliac disease have been successfully treated with diets rich in vitamin B_2. It is believed that lack of the extrinsic factor in the diet is chiefly responsible for the anæmia in these conditions.

In the pernicious anæmia of pregnancy there is evidently a lack of the intrinsic factor during pregnancy, and a partial return after parturition.

H. GODFREY BIRD

A Comparison between the Bendien Chemical Test and the Sedimentation-Rate Test in the Prognosis of Tuberculosis. Fine, J. and Dunlop, D., *Quart. J. of Med.*, 1933, 2: 201.

The authors have investigated the blood from 36 cases of tuberculosis at fortnightly intervals, over a period of five months. In all, 151 Bendien tests were carried out, usually simultaneously with the sedimentation rate. A modification of the original Bendien technique was used, apparently with most satisfactory results. The mechanism of the two tests is discussed and statistical comparisons of results are presented in detail. The altered protein balance of the blood, following absorption of necrotic material formed in association with an active tuberculous lesion, manifests itself physically in a relative increase in specific gravity of the red cells (sedimentation rate increased) and chemically by displacement to the left, in the Bendien test. According to current theories, increase of fibrinogen and globulin in the plasma is held to account for an increased sedimentation rate while a relative increase in globulin is Bendien's explanation of a displacement to the left in his test. The authors' results show a lack of absolute parallelism which would agree well with the idea that certain proteins influence both tests, while others only influence one test or the other.

The Bendien test would seem to be not subject to such minor fluctuations as is the sedimentation test, and hence any variations are of more prognostic significance. It also has the advantage of being a serum test, which can be done any time within a period of several days, and does not tie one to the patient and to the clock as does the sedimentation test. Its disadvantage is in requiring two very accurately prepared reagents. The authors feel that it may safely be adopted as an alternative prognostic test where the sedimentation-rate test is impracticable.

W. FORD CONNELL

Obituaries

Dr. Frederick Adam Cleland, a leading figure in surgical practice in Toronto, died suddenly on November 26th, in his sixtieth year, from coronary thrombosis. He had suffered two previous attacks, but was able to conduct his practice until the last.

Dr. Cleland came of a family influential in business and public affairs, the son of James and Sarah Butchart Cleland, and was born and prepared for matriculation in Meaford, Ont. Entering the University of Toronto in the Faculty of Arts, he lived in the residence in the north wing of the main building, since abandoned, but famous in its day for the powerful life-long friendships made within its walls. After four years full of vigorous interest in all student activities, including a place in the cricket eleven, and captaincy of the lacrosse team, he entered medicine with a mind well matured, and graduated in 1901 with the silver medal.

Desirous of post-graduate work, and without funds, he then followed the suggestion of Meaford friends living in New York City, and "hung out his shingle" on West 42nd Street. He built up a large general practice which he maintained throughout his stay there. Practical in the affairs of life, he managed his time rigidly, in order to give assiduous attention to the hospital work which was his goal. Obtaining posts in the surgical dispensary of the New York Post-Graduate Hospital, and as demonstrator of Anatomy in the New York Polyclinic, he worked up gradually to be an assistant in Gynæcology, under Taylor at the Polyclinic, and decided to make this his special life-work. He continuously spent much time in operative work on the cadaver, and always valued greatly the facilities for this work in the big centres. In later life he made many short trips to New York or Chicago, to rapidly perfect himself in some new technique.

Having married Miss Anna Goldie, of Ayr, Ont., thoughts turned homeward, and in 1909 he returned to Toronto to endeavour to establish himself as a gynæcologist and abdominal surgeon. This second experiment of undertaking a new venture with slender financial resources met with success also, and the rapidity of his rise to a responsible position in practice was remarkable. The qualities which contributed largely to this were a quick sympathy with the viewpoint of the patient, excellent judgment in planning action, courage and quickness in changing plans during an operation, and detailed post-operative care, begotten of years spent in general practice. His operative technique was finished in quality.

In practical medical life, he first received a teaching appointment in Gynæcology and Obstetrics under Dr. Frederick Fenton in St. Michael's Hospital, and succeeded him in charge of this work. He was later asked to form a gynæcological service in Grace Hospital, and transferred his university appointment

to the surgical service of Professor Cameron at the Toronto General Hospital. Here he worked until 1922, when he was appointed Assistant Professor of Gynæcology and Obstetrics, relinquishing this post owing to impaired health in 1928.

He was always active in the affairs of the Academy of Medicine, and rose to the presidency. During his term in the latter office, the outstanding events were the visits of Lord Dawson and Sir Ewan MacLean, of Cardiff, and the dramatic announcement to the medical world by Blair Bell of his lead treatment of cancer.

Dr. Cleland was elected Fellow of the Association of American Gynæcologists, Obstetricians and Abdominal Surgeons in 1926, and was Vice-president for their meeting in Toronto in 1928.

In 1918 he went as Senior Surgeon with the Canadian Expeditionary Force to Siberia.

In private life the loyal maintenance of old friendships and the pleasures of travel occupied his time. A martyr to hay-fever, he always took a long autumn holiday, often a trip abroad, and in mid-winter in later years he went south for three or four weeks. His steady and deep pleasure was his enjoyment of family life, and in this he was singularly blessed. He is survived by his widow, two sons and two daughters, and four brothers. H. S. HUTCHISON

Dr. Herbert P. Byers, of Brandon, Man., died on November 24, 1933. The passing of Herbert Byers severs a tie with the early pioneering days of south-western Manitoba. Born near Sheffield, England, on September 17, 1860, he received his school education at King's Lynn and Manchester, and then commenced at Leeds his long association with medical practice. There, as was the custom in those days, he was apprenticed to a general medical practitioner and also attended the hospital service, already famous for the early work of Clifford Allbutt. In 1882 he came to Manitoba, and for some years was active in the survey of western Canada. Resuming his medical studies, he graduated at the Manitoba Medical School with Gordon Bell in the class of 1890. He then went out to the new settlement of Melita, at that time a small collection of tents on the hill to the west of the present town. Here, save for six years at Selkirk, from 1895-1901, was the scene of his life's work. For many years he was a keen cricketer, excelling in his ability behind the stumps; indeed to him may truly be given the highest praise desired by an Englishman, that of having played cricket all the days of his life. Though, after his return to Melita he took little part in the affairs of the province outside his own area this was due to his devotion to his task, to bring his very best to the case, comfort and health of his people and to keep himself abreast of modern advances. True to his type, he seldom used the knife, but left the surgical treatment of his patients to those of his colleagues who were more recently trained and more accustomed to the art, but generations bless him for his skill in diagnosis, his wise choice of treatment, and of his ever-gentle and diligent care. No journey was too difficult for him, and pecuniary reward was his last thought. In his association with those who succeeded each other in sharing with him the medical service in Melita and south-western Manitoba he was, in all but name, the very pattern of an elder partner. During the past few years, the increasing difficulties of practice in that sore-stricken area weighed heavily upon him, and it was distressing to note the loss of elasticity in his step, which till after his seventieth birthday was so marked a characteristic. It still was with difficulty that he was finally persuaded to drop his activities and to retire to a residence in Brandon. For many years he held the appointments of Health Officer to Melita and the Municipality of Arthur, of Coroner, and of Medical Officer to the Canadian Pacific Railway.

In his family life he was most happy. In 1886 he married Miss Ann E. Pruden, of Selkirk, and by this union had three children, of whom Constance and Fred survive him. His first wife died in 1916. In 1918, he married Miss Edna Irvin, of Morden, by whom he is survived, and also by their three children, Harold, Betty, and Peggy. He was ever a faithful member of the Church of England, and was affiliated with the Sons of England. The service at Brandon on November 27th, was conducted by his old friend, Bishop Thomas, and his remains were taken to Melita and laid beside those of his first wife and their child.

At Brandon, the Manitoba Medical Association was represented by Dr. T. A. Pincock; the Brandon Medical Society by Dr. H. S. Sharpe, and Dr. N. R. Rawson; the Sons of England by Bro. A. Veale, Grand President of Manitoba, and Bro. G. N. V. Davis, President of the Brandon Lodge. At Melita, the funeral arrangements were made by the local Lodge of Sons of England, of which the Doctor had been a member for many years. It seemed as if the whole district turned out to pay a last tribute of love and appreciation. N. B. RAWSON

Dr. Albert Charlebois died in Ottawa on November 20th at the age of 49. He was born at Hull in 1884, and studied at the College of Ste. Thérèse, taking his medical degree at Queen's University, Kingston. He graduated in 1908. He later took up the specialty of pædiatrics and established himself in Ottawa where he was appointed as pædiatrician to the foundling service of the Miséricorde Hospital. He was also for some years in charge of pædiatrics at the General Hospital of Ottawa and of the Sacred Heart Hospital at Hull. Dr. Charlebois took active part in the work of the Association des Médecins de Langue Française de l'Amérique du Nord, which met in Ottawa in 1932. In spite of his numerous occupations in medicine he found time to devote himself with enthusiasm to literature and the organization of charitable bodies, as well as being a leading figure socially. He was director of the Alliance Française and of the Canadian Club and a member of the committee France-Amérique and director of the Rampe.

Surviving besides his widow, the former Maria Carrière, are two daughters, the Misses Margaret and Madeleine Charlebois, at home; and three brothers, Léon and Basile Charlebois, both of Hull, and Valence, of Ste. Anne de Bellevue.

Dr. A. O. Comiré. An outstanding figure has lately disappeared from the field of medicine in the district of Richelieu in the person of Dr. A. O. Comiré, of St. François-du-Lac, who died on October 26, 1933, at the age of 78. He was born at Yamaska, and studied at the Seminary of Quebec, graduating in medicine from the school of Victoria (1880), which is to-day the University of Montreal. He concluded his studies in 1880. He was interested in agricultural problems and founded the Society of Apiarists in the province of Quebec. He was Liberal in politics and had always taken a large part in the organization of his party. His outstanding characteristics, however, were his charity and devotion to the service of the poor.

Dr. Alice Constantineau (née McLaughlin) died in Ottawa on October 12, 1933. Dr. Constantineau, who, for many years previous to her death, had resided in Ottawa, had not practised her profession since her marriage. She was a graduate in medicine of Trinity University, Toronto (1887).

Dr. Alban Frederick Emery died in the Saint John General Hospital on December 7, 1933. Dr. Emery was born of Irish-English parents in Saint John on March 25, 1856. He was educated in the public schools

and grammer school of Saint John and the Normal School at Fredericton, after which he taught school for eight years. His medical training was received at Bellevue Medical College, New York, from which he graduated in 1887 with special honours. Soon after graduation, he was appointed Superintendent of the General Public Hospital of Saint John, which position he held for two years. During these years he was instrumental in introducing many innovations in hospital practice, and greatly aided in popularizing the hospital idea in the minds of the public. He was the prime mover in establishing the training school of nursing in Saint John. For a long period, he was chairman of the Board of School Trustees, and it was during this time that he introduced vocational training into the city schools. He was one of the earliest workers to insist on the establishment of the Saint John Tuberculosis Hospital, and in late years has been active on the consulting staff, after having served for many years as physician and surgeon on the staff of the General Hospital. He was a past president of the Saint John and New Brunswick Medical Societies, and within the last couple of years he re-established the St. Patrick's Society of Saint John, being President at his death. He was a Liberal in politics and twice contested elections for the Dominion House of Commons. He was a past-master of Carleton Masonic Lodge. Dr. Emery suffered three crippling periods of illness, which in each case dissipated his practice, and three times he made startling "come-backs", so that at the time of his last illness, he enjoyed a large general and consulting practice at the age of 78. He possessed diagnostic ability of a high excellence, was a man without an enemy, a great helper of young physicians, and the acme of modesty in his profession, a physician beloved by his patients, a colleague respected by his fellow physicians.

A. STANLEY KIRKLAND

Dr. William Henry Maines Jeffs, of Toronto, died on November 14, 1933, at his late residence. He was born in 1864, and was a graduate of Trinity Medical College (1888).

Dr. F. X. Morier died on October 20, 1933, at the age of 47, in Quebec city. He was born at Saint Jean Baptiste-de-Rouville. He later moved to Saint Hyacinthe where he took his classical studies at the seminary. He began the study of medicine in the University of Montreal, took part in the War, attached to an ambulance corps, and on his return in May, 1917, continued his studies and graduated in 1919.

Dr. Charles Baird Oliver, of Chatham, Ont., for 43 years a prominent physician in southwestern Ontario, died suddenly on November 19, 1933, at his residence.

Dr. Oliver was 67 years of age, and was born in Motherwell, near St. Mary's, where he attended public and high schools. He graduated in 1890 from Trinity Medical College, Toronto, and started practice in Ruthven, Essex County, later coming to Kent and settling first in Merlin and then in Chatham.

He had been practising medicine in Chatham since 1912, specializing in obstetrics. In 1911 he took a post-graduate course at the Rotunda Hospital, Dublin, and in hospitals in London, England. He had attended more than 5,000 maternity cases, believed a record for the continent. Dr. Oliver was a member of the Examining Board of the Toronto College of Physicians and Surgeons. His wife died last March, and since that time he had been in failing health.

Outside of the practice of his profession Dr. Oliver took an unusually active part in public affairs. In politics he was a Liberal and in 1926 he was a candidate for the Legislature in the riding of West Kent. He was probably best known for his great patriotism. During the war he attended, without charge, all of the families of the men of Chatham who were overseas. Since the war he gave liberally of his time, talent and means for all patriotic causes, and it was due largely to his organizing ability and his personal efforts that the monument was erected to the fallen heroes of this district in Memorial Square in Chatham.

He was an ardent sportsman, and was a generous supporter of all forms of athletics. In his university days he received attractive offers to enter the field of professional baseball.

Dr. Oliver was an elder in St. Andrew's United Church of Chatham, and was noted for his generosity toward all religious causes, and was a member of various fraternal organizations. He was a Past Master of the Masonic Order.

Surviving members of his family are one son, Douglas R. Oliver, of the staff of the Toronto Mail and Empire, and one daughter, Mrs. Wesley Barrett, of Chatham.

Dr. James William Reid, of Windsor, N.S., died on October 30, 1933, from a heart attack with which he was seized the day before.

Born at Musquodoboit, N.S., on May 30, 1859, a son of the late Mr. and Mrs. Robert Reid, he received his early education in a common school and attended Halifax Medical College, graduating in medicine in 1884. He set up his first practice in Elmsdale and after a year there removed to Rawdon Gold Mines. After two years there he removed to Windsor, where for a short time he was associated with the late Dr. J. B. Black in the practice of his profession.

Dr. Reid was twice married. His first wife was Miss Mary Falconer, daughter of the late Dr. and Mrs. A. F. Falconer, of Sherbrooke, N.S. Their sons are Dr. A. R. Reid, Windsor; Dr. J. W. Reid, Jr., Halifax, and the daughters are Mrs. Gerald Foster, Ottawa; Miss Gwendolyn, New York City; Miss Dorothy, New York, and Miss Sybil with relatives in West Gore. Mrs. Mary Reid passed away in 1915. The second and surviving Mrs. Reid was before her marriage Miss Lizzie Smith, daughter of the late Mr. and Mrs. Charles de Wolfe Smith, of Windsor. Besides his widow and children he is survived by two brothers, Mr. Edward Reid, Medford, Mass., and one sister, Mrs. Laura McCurdy, Old Barns, N.S.

Demands upon his time as a general practitioner did not prevent Dr. Reid from taking an active part in the life of his adopted town and country, serving in the Town Council and representing Hants in the Local Legislature.

In his family circle and among his many friends, the passing of Dr. Reid will be sincerely mourned. In his professional service he never failed to respond to a call. No monetary consideration prevented him from going to the bedside of rich or poor alike, and the most severe storms were not allowed to interfere with his duty as a physician.

The greatest pill-taker on record appears to have been one Jessup, a worthy grazier of Hickington, who died in Lincoln in 1814 at the age of sixty-five. For twenty-one years he took pills at the rate of 29 a day, which number he increased to 78 towards the latter part of his life. In twenty-one years he is stated to have swallowed 226,934 pills and drunk 40,000 bottle of mixture, which were all supplied by an apothecary of Bottesford, who sued Jessup for the bill at the Lincoln Assizes shortly before he died.—C. J. S. Thompson in "The Mystery and Art of the Apothecary."

News Items

Great Britain

Princess Elizabeth of York Children's Hospital.—At the Princess Elizabeth of York Children's Hospital, Shadwell, on Sept. 29th, Prof. D. Fraser-Harris gave an interesting and stimulating discourse to the nursing staff on "Science and poetry." The poet he described as the person who can say so much better than anyone else what everyone is feeling. Poetry is an attitude of mind—the emotional disposition. It is the reverent love of beauty. There are persons who are poets and yet have never written two words that rhymed. In neither science nor poetry does familiarity breed contempt. The poet and the scientist shun the attitude of *nil admirari*. Had not Carlyle said that the rising of the sun was a daily miracle? The minute details of those exquisitely finished organs, the eye and the ear; the symmetry of snow-crystals; the perfection of a flea's mandibles under the microscope are a revelation of beauty to the man of science. After enumerating some of the scientific poets such as Goethe, Erasmus Darwin, and Oliver Wendell Holmes, and reminding his audience that Goldsmith and Keats had studied medicine, the lecturer touched on the relationship between poetry and religion. The latter without the "beauty of holiness' he described as the most repulsive form which the activity of the mind of man can take. Poetry clings to faith like the scent of roses to the bowl. The address was illustrated by appropriate quotations from the Bible, from Shakespeare, Tennyson, Gray, Cowper, Burns, Byron, and Sir Ronald Ross.

Prof. Leonard Findlay, M.D., the Senior Visiting Physician at the Hospital, proposed a vote of thanks to the lecturer which was seconded by Dr. E. W. Goodall, O.B.E.

The large audience included physicians, sisters, and nurses from the various London hospitals; Mr. H. L. Jackson, Chairman of H. K. Lewis & Co., Sir John Weir, Physician to the Prince of Wales, Dr. J. F. Halls Dally, and Dr. K. R. Hay.

W. R. BETTS

History of Medicine Section, Royal Society of Medicine.—At a meeting of this section, held on November 1, 1933, under the presidency of Sir StClair Thomson, Prof H. Burger, of the University of Amsterdam, read an interesting paper on "The doctor, the quack, and the appetite of the public for magic in medicine." Dr. Burger was Rector Magnificus of his university during 1927-8 and is Secretary-General of the International Committee for the International Congress of Medicine. His communication was remarkable for its wide knowledge, its comprehensiveness, and the fluent and idiomatic English in which it was delivered. Among the great army of quacks, the Professor said, the virtuous ones constitute a negligible minority. For many years he had been interested in those quacks who professed to cure deafness. He dealt successively with the three aspects of quackery; the comical, the philosophical, and the dark social. Superstition was deeply ingrained in human nature, however highly educated the man or woman may be. Important contributions to the subsequent discussion were made by Sir Thomas Barlow (now in his 89th year), Mr. Warren Low, President of the Royal Society of Medicine, and Prof. Leonard Findlay.

The History of Medicine Section, which was created in 1912, has numbered among its presidents Sir William Osler, Sir Norman Moore, Sir D'Arcy Power, Sir Humphry Rolleston, Dr. Herbert Spencer, and other notable historians. It continues to be a flourishing section of the Society.

W. R. BETTS

Alberta

A great many physicians have applied for specialist's certificates from the University, by reason of the fact that this is the last year when these certificates will be given on the basis of practice only. The Specialist's Committee is meeting in Edmonton, to deal with the applications and also to make regulations for 1934. It has been definitely decided that the regulations will in future be more difficult to meet.

G. E. LEARMONTH

British Columbia

The annual convention of the British Columbia Hospitals Association was held in Victoria, from Nov. 8th to 10th. Questions of finance, and the privileges of osteopaths in recognized hospitals came up for discussion.

During the past three months there has been an epidemic of scarlet fever in the city of Vancouver and its neighborhood. During October, 107 cases were reported. The outbreak is of a mild type, and, to date, there have been no deaths.

The North Pacific Surgical Association met in Victoria, Dec. 1st and 2nd, under the presidency of Dr. T. W. McPherson. The recent tragic death of Dr. R. C. Coffey, of Portland, Oregon, a most distinguished member of the Association, was a matter of deep regret.

In a recent suit, in Vancouver, by a barber, for services in treating baldness, a plea by the defendants that this had constituted the practice of medicine was rejected by the court.

Something unique in the annals of the Vancouver Medical Association was enjoyed on Dec. 4th, when Dr. Wilder Penfield, of Montreal, spoke on the study and treatment of epilepsy, the illustrations being furnished by moving pictures of cases and operations.

C. H. BASTIN

Manitoba

The annual meeting of the Winnipeg General Hospital was held on November 9th. The report of the Board of Trustees showed that the hospital has had a difficult year. The new Hospital Aid Act passed at the last session of the Manitoba Legislature, reduced both the amount recoverable from the municipalities by 14 per cent and the government grant by 20 per cent, which entailed a loss of more than $40,000 a year to the hospital. In addition the new rate of the government grant was made to apply to last year's operations, resulting in the withholding by the government of the payment of nearly $15,000. Salary and wage-cuts with other economies resulted in a reduction of $86,000, enabling the operating account to be balanced. Revenues, however, were insufficient to absorb the financial charges and therein lay the deficit. The Board of Trustees state that there is grave danger that the efforts of governing authority to protect the forgotten man will create the forgotten institution. Additional semi-public beds were made available for those unable to pay the full cost and permitting them to be under the care of their own physician. An effort has been made to have the hospital participate in the unemployment relief funds for the care of patients on unemployment relief, but, so far, this has been non-productive. The Superintendent states that cancer is now the "captain of the men of death" in this hospital, in spite of the relief or apparent cure effected in many cases under the present methods of treatment. The per capita per

diem cost for all maintenance, including interest and taxes is $3.35, one cent less than last year in spite of considerably lessened occupancy.

The bi-monthly meetings of the honorary attending staff were carried on with their usual effectiveness. The average attendance was more than seventy-five at each meeting. The post-graduate phase of the hospital work has been amplified by instituting further ward rounds open to the medical profession. The tumour service has been reorganized, and the clinics increased to two a week, to cover the follow-up work necessary. Drs. G. S. Fahrni and M. R. MacCharles have been added to the honorary indoor staff as surgeons. Drs. J. R. Davidson and F. J. Hart, who have given long and valued service on the honorary attending staff in medicine, will retire shortly.

The annual Armistice service was held in the Medical College on November 11th. Dr. W. W. Musgrove, President of the Manitoba Medical Alumni Association, presided, and Dr. Ross Mitchell gave the address.

ROSS MITCHELL

New Brunswick

Dr. E. W. Lunney, Anæsthetist at the Saint John General Hospital, was the speaker at the November meeting of the Saint John Medical Society. The title of his paper was "The progress of anæsthesia." Under this heading Dr. Lunney discussed the improvement in clinical methods in anæsthesia, improved mechanical aids, and special methods, such as, intratracheal, rectal and intravenous administration. The attendance at this meeting was gratifying and the discussion was participated in by a large number of those specially interested. On invitation of the Boston Society of Anæsthetists, Dr. Lunney is proceding to Boston to read a paper entitled" Some observations on the modern anæsthetic trend."

Dr. C. W. MacMillan, Medical Officer of Health for the southern counties of New Brunswick, announced that, by radio broadcast and newspaper publicity, his Department is about to engage in another educational campaign on the subject of immunization against diphtheria. It is about two years since the last departmental effort along this line was completed, with gratifying results in the lessened incidence and morbidity of diphtheria. An effort is being made to have the family physician effect the immunization, but in the case of indigents arrangements will be made to have it carried out at public clinics.

Due to difficulties of transportation caused by the early onset of winter weather, it was found impossible to remove a seriously ill patient from the island of Shippegan to the mainland for treatment. Under these circumstances, at the request of the local parish priest and the R.C.M.P., the Attorney-general's Department of New Brunswick arranged for Dr. C. R. Baxter, of Moncton, to be flown to the bedside of the patient, with the intention that he should be removed by plane to Moncton. On arrival at Shippegan, damage to the plane prevented immediate return, and it was necessary for Dr. Baxter to operate in the village. This is not the first instance that aerial transportation has made available surgical and medical relief to patients in the outlying parts of this Province. Cooperation of Government agencies and police facilities have in all cases been cordially provided to assist the medical man in his errand of mercy.

Dr. A. F. Emery, one of the oldest practitioners in New Brunswick, has been confined to the Saint John General Hospital for a considerable period. It is regretted that no improvement in his condition can be reported.

Dr. Maurice E. Hobbs and Dr. H. A. Borden, graduates of the Toronto University, 1932, who have each had an interneship of one year at St. Michael's Hospital in Toronto, were recently appointed junior physicians at the Saint John Tuberculosis Hospital.

Dr. R. W. Grant, who for some years has been an assistant physician at the Saint John Tuberculosis Hospital, has now taken up general practice in Sussex.

A. STANLEY KIRKLAND

Nova Scotia

At a recent meeting of the Board of School Commissioners of the City of Halifax a delegation representing the Halifax Medical Society proposed a plan of immunization for all school children. The delegation was headed by Dr. H. G. Grant, Professor of Preventive Medicine at Dalhousie University. Other members were Drs. Gerald Burns, Gordon Wiswell and John Merritt. This immunization work has been carried out in numerous centres for a long time, but heretofore such systematic immunization has not been in vogue in Halifax schools. Expenses in connection with this work will be defrayed by funds from different sources.

The Nova Scotia Society for Mental Hygiene celebrated its twenty-fifth anniversary on December 4th. This is the pioneer Canadian society in this field. The President, Dr. S. H. Prince, in his address stressed the importance of providing modern facilities for care and treatment of the mentally afflicted. More important was the suggestion of a ward in some hospital where mental cases could be observed.

Dr. G. H. Murphy has been elected a member of the Council of the Royal College of Physicians and Surgeons of Canada.

Dr. John Archibald MacLean, a graduate of Dalhousie University of 1924, passed away at the age of 37 at the Victoria General Hospital. He had been engaged in active practice in Glace Bay since graduation.

N. B. DREYER

Ontario

Dr. Alexander McPhedran, Professor-emeritus of Medicine, University of Toronto, and a past-president of the Canadian Medical Association, celebrated his eighty-sixth birthday in December.

Dr. B. T. McGhie, who has been Director of Ontario Hospitals, has recently been appointed Acting Deputy Minister of Hospitals.

Dr. W. E. George, for 21 years District Medical Officer of Health in Northern Ontario, has been transferred to the Hamilton district. Dr. Murray Thomson, of Toronto, has been appointed District Medical Officer of Health to succeed Dr. George.

The Academy of Medicine reports a very valuable addition to its collection of books from the library of Dr. Charles A. Hodges, C.M.G. Particular reference might be made to the books on sociology and public health.

One of the strongest organizations ever to undertake a public campaign in Toronto has been completed, under the general chairmanship of the Honourable

Vincent Massey, to raise $300,000 by public subscription for the new Sisters of St. John the Divine Convalescent Hospital campaign.

On Saturday, December 9th, a delightful complimentary dinner was arranged at the Toronto Hunt Club in honour of Prof. F. N. G. Starr, upon his appointment as Professor-emeritus in the University of Toronto, following his retirement from active teaching.

J. H. ELLIOTT

Saskatchewan

At the November staff meeting of the Regina Grey Nuns' Hospital Dr. Gareau presented a case of encephalitis confirmed by autopsy. The interest of the case lay in the application of forced drainage of spinal fluid as described by Kubie and Retan. In the course of five days the child was given about 5000 c.c. of hypotonic saline by the continuous intravenous method. The flow of spinal fluid was greatly accelerated and at times amounted to as high as three or four drops per minute. No appreciable improvement was noticed in the child's condition, though treatment was started when the child was in a very advanced state of the disease.

Dr. Larson presented a case of ulcerative endocarditis and puerperal sepsis. The patient was a primipara, 46 years of age, sent in from the country at the end of pregnancy. She had had high blood pressure and cardiac asthma during pregnancy. The membranes ruptured early in labour. She showed albumin. Bag induction was performed; there was a persistent posterior position calling for rotation. After the cervix was dilated forceps were used; the placenta had to be removed manually. Non-hæmolytic streptococci were cultured from the blood. The patient lived two weeks after delivery. The post-mortem findings were localized endometritis and ulcerative endocarditis, also atheroma of the aorta and of the coronary arteries. In the discussion that followed, it was the consensus that Dr. Larson had been working against impossible handicaps, and that the patient probably had a pre-existing heart condition due to high blood pressure and hardening of the arteries before pregnancy took place.

Dr. Trudelle presented a patient with enlarged liver and spleen. She was 38 years of age, mother of four children. She had had one miscarriage between the second and third child. For the last six years she had been having liver trouble and had had x-rays taken of the liver and gall bladder in another city. The findings were essentially normal, except that the liver showed enlargement down to the umbilicus; the spleen was also enlarged and palpable. The blood picture was normal, except for the slight increase of eosinophiles. The patient's blood Wassermann test was strongly positive, as was also that of her husband. In the discussion that followed there was general agreement that arsenical preparations were not indicated, and that the treatment should be injections of mercury or potassium iodide by mouth. The blood of the children has not yet been examined; they live in the country.

Col. Frederick Guest, staff surgeon at the Royal Canadian Mounted Police barracks of Regina, retired in December, on reaching the age-limit under civil service regulations. As a measure of economy his place wil not be filled by a full-time surgeon. Dr. Guest, previous to his appointment practised medicine in Regina and will retire to Ontario. During the war he served with No. 3 Stationary Hospital, arriving there early in 1915. Later he commanded military hospitals in England. After he came to Regina as a unit director of the Soldier's Civil Re-establishment.

Dr. M. A. Currie, speaking to the University Women's Club of Regina, said that one great step forward had been taken in the matter of public health in Saskatchewan in requiring a health examination from a man before he can obtain a marriage certificate and that Saskatchewan deserves great credit as it is the only province to have such an act on its books; but both parties to a marriage should be required to produce a health certificate. He spoke of the progress made in recent years in medical science in North America and in Europe. He mentioned two trends of public health advancement for the future. One was towards the eradication of incurables and the other towards birth-control. There are types of intolerable pain and incurable diseases where the sufferer would gladly be sent to sleep and not allowed to waken. Dr. Currie said that in ten or twenty years this subject would be before the public prominently. He cited a case where recently an American jury acquitted a man who had taken it on himself to end the sufferings of an incurable. In the old country, much is done on the subject of birth-control. Birth-control clinics would be very valuable here.

LILLIAN A. CHASE

United States

Research on the Gonococcus.—A Survey Committee for Research on the Gonococcus and Gonococcal Infections has been formed by the Division of Medical Sciences of the National Research Council, in cooperation with the American Social Hygiene Association. Its purpose is to collect, analyze, and collate the facts already established and the efforts now in progress to add to knowledge of the gonococcus and gonococcal infections, especially as regards bacteriology, pathology, immunity, mechanism of infection, and some of the forms of treatment. Attention will be concentrated chiefly on work done in the United States. At the close of the preliminary survey the Committee, with the assistance of a conference of experts, will compile a report with the object of stimulating interest in the study of the gonococcus, of providing a point of departure, and of suggesting promising leads for further investigation. The survey will cover the literature, but it is hoped that unpublished work, and studies which were incomplete or whose results were inconclusive, may also be included.

Dr. Stanhope Bayne-Jones, Chairman, earnestly invites the cooperation of workers interested in this field. Headquarters have been established at Room 1101, 450 Seventh Avenue, New York, where communications and reprints will be welcomed.

The American Conference on Birth Control and National Recovery is to hold a meeting in the Mayflower Hotel, Washington, D.C., on January 15, 16 and 17. Medical sessions will be held all day Tuesday, and Wednesday afternoon will be given over to a Round Table Discussion on the establishent and administration of Birth Control Clinics under private medical auspices and in public institutions.

This conference is under the auspices of the National Committee of Federal Legislation for Birth Control, Inc., Margaret Sanger, President, 1343 H Street, N.W., Washington, D. C.

Dr. George R. Minot, Professor of Medicine, Harvard University, has been awarded the Moxon Gold Medal of the Royal College of Physicians of London.

General

Education and Training for Mentally Retarded Children in Canada.—In 1927 an interesting project was undertaken in Ottawa for the training of mentally handicapped girl children. Shernfold School was originally organized under the auspices of the Canadian

Council on Child and Family Welfare and staffed by Sisters of St. John the Divine. It now operates as a separate corporation under the direction of a volunteer board.

The School is residential. Provision is made for female children only. The admitting age is from five to sixteen years and the number of pupils is limited to fifteen. The School is not operated for profit; no salaries are paid the staff, so the cost of pupil residence and tuition represents only the actual cost of equipment, maintenance of the building, children and the staff in residence. There have been many generous gifts from the individual members of the Board and interested friends of this project which have also gone to lessen the fees necessary to maintain the School. The School is non-denominational and children are admitted from any province of Canada, provided they fall within the categories prescribed for admission. The School is equipped to give a great deal of individual attention to children who are able to profit by such attention, so the Board reserves for itself the privilege of selecting from the applicants the group of children who will profit most from the opportunities offered by the School. Excellent psychiatric and medical supervision is provided, respectively from the Ontario Hospitals Clinic Service and volunteer consultant medical services. A graduate nurse is in residence.

The physician frequently finds himself at a loss for satisfactory school provision for mentally-handicapped children coming to his attention. Shernfold School with its delightful homelike atmosphere and, at the same time, excellent educational and training facilities, offers a solution for some of the physician's puzzling problems related to mental retardation.

Death-rate in Tuberculosis.—Canada's death rate from tuberculosis of all forms in 1932, was 67.9 per 100,000 population. The deaths totalled 7,123 from all forms of the disease and 5,836 people were registered as dying from the pulmonary form. Canada has 7,628 beds operating in institutions for the care of the tuberculous and a conservative estimate is that 89 per cent or 7,475 beds are available for the treatment of pulmonary cases, this actually being 1.28 beds per pulmonary tuberculosis death each year.

Medical Service by Radio.—A radio service is now maintained between all the settlements in the northerly areas of the Dominion and the Department of Health. When a person requires medical treatment the symptoms and condition of the person injured or ill are transmitted to Ottawa by radio and a qualified doctor prescribes the necessary treatment, and if medicine is required a prescription is given, for at each settlement a supply of drugs is kept on hand.

As a result of this service, relief has been brought to the patient, and sometimes when it has been thought that the complications were serious a quick improvement has resulted from following the instructions given from Ottawa. Most of these stations in the far north are several days' journey from a doctor, but only a few seconds distant from Ottawa by radio.

The glories of our blood and state
Are shadows, not substantial things;
There is no armour against fate,
Death lays his icy hand on kings:
Sceptre and crown
Must tumble down,
And in the dust be equal made
With the poor crooked scythe and spade.—*Shirley.*

Book Reviews

Recent Progress in Medicine and Surgery, 1919-1933. By various authors. Edited by Sir John Collie, C.M.G., M.D., D.L., J.P. 368 pages, illustrated. Price 16s. net. H. K. Lewis, London, 1933.

This book is made up of a series of papers by well known writers, indicating advances of knowledge made since the war, and blended in readable form in a series of well-written and interesting articles.

As an indication of the wide field covered the following subjects are considered: endocrinology, neurology, peptic ulcer, rheumatism, diabetes, the eye, vitamins, pernicious anæmia, manipulative surgery, diphtheria immunization, anæsthesia, radiology, surgical tuberculosis, oto-rhino-laryngology, physical and tropical medicine. We miss, however, any reference to pulmonary tuberculosis and its treatment by artificial pneumothorax and surgical measures.

Although the writer on diabetes states that more latitude is allowed in the use of carbohydrates than formerly, he makes no mention of the high carbohydrate and low fat diet now so extensively used. Indeed in his ingenious and useful diet tables the allowance for a sedentary individual of 140 lbs. works out as carbohydrate 100; protein 75; fat 150, an allowance of fat which many workers now regard as unnecessary and replaceable by carbohydrates.

Wholesale tonsillectomy in rheumatic children is regarded as senseless, as pharyngitis can equally lead to severe rheumatism. Removal should only be recommended for mechanical obstruction, for continued sepsis, or for repeated sore throats leading to recurrent rheumatism. In the last-named condition there is often lurking infection and tonsillectomy will then greatly reduce the number of upper respiratory infections and of rheumatic attacks. The duration of active rheumatic infection and the period during which strict rest is required is often a difficult matter to decide. A normal pulse and a steady gain in weight are propitious signs, whilst a high sedimentation rate of citrated blood is an indication of active rheumatism. It might be added that an increased leucocyte count is also evidence of activity.

Active diphtheria immunization is strongly recommended, and even from the financial side the expenditure for a single case in an isolation hospital would suffice to protect 200 children.

A chapter on manipulative surgery is most illuminating, in showing that rapid relief from pain and disability is frequently attained, and that joint manipulation is a definite art with a technique of its own, whilst the use of force may be attended by disastrous results.

Though space prevents a reference to but a few of the articles we can cordially recommend the book as a useful reference work on recent additions to our knowledge, and even special workers can hardly fail to benefit by a perusal of subjects outside their own immediate interests.

Text-Book of Pathology. Robert Muir, M.A., M.D., ScD., LL.D., F.R.S., Professor of Pathology, University of Glasgow. Third edition, 957 pages, illustrated. Price $10.50. Ed. Arnold, London; Macmillan Co., Toronto, 1933.

Since the first appearance of Professor Muir's Textbook of Pathology in 1924 it has been one of the premier text books on the subject in the English language and has been in extensive use throughout the British Empire. The subject matter of this third edition has been rearranged, some portions rewritten, and certain additions made in accordance with the advances in our knowledge of morbid conditions since the appearance of the last edition. This book is highly recommended to both practitioners and medical students.

Combined Text-Book of Obstetrics and Gynæcology. J. M. Munro Kerr, J. Haig Ferguson, James Young and James Hendry. Second edition, pp. XII-1100, illustrated. Price $10.50. E. & S. Livingstone, Edinburgh; Macmillan Co., Toronto, 1933.

Since the first edition of this well known book appeared ten years ago there have been many advances in all branches of medicine, not excepting obstetrics and gynæcology, and that new knowledge is presented in this second edition, which has been largely rewritten. Three special chapters have been introduced: "The problem of maternal mortality"; "The infant in its first month" by Professor Charles McNeill; and "Radiology" by Dr. J. Duncan White. The book reflects the best teaching of the medical schools of Glasgow and Edinburgh, and for a work of four authors the style is remarkably uniform. As might be expected from such a source the subject of dystocia is particularly well handled. Recent advances such as low Cæsarean section, inflation of the tubes as a test of their patency, the use of lipiodol in the x-ray diagnosis of lesions of the genital tract, the cautery for treatment of chronic cervicitis, radium and x-ray in malignancy of the cervix, uterus or ovaries, are so described and illustrated as to bring the book thoroughly up to date. It may be heartily commended to students and medical practitioners.

The Clinical Study and Treatment of Sick Children. John Thomson and Leonard Findlay. Fifth edition revised and enlarged. 1075 pages, illustrated. Price $9.00. Oliver & Boyd, Edinburgh and London; Macmillan Co., Toronto, 1933.

John Thomson's well-known text-book, the last edition of which appeared in 1925, has been rewritten and enlarged by Leonard Findlay. The present edition, like its predecessors, aims to be a record of personal experience, and in this feature its chief distinction and value will be found to lie. Little is said about the physical signs of common diseases, except where in children they differ from those in adults. The chapters on nutritional diseases, on rickets, scurvy, rheumatism, tuberculosis have been entirely rewritten; while other sections, such as that on lead-poisoning, have not been brought into conformity with present knowledge and procedure. Forty-one pages are devoted to a discussion of rickets, while the subject of cerebral hæmorrhage in the new-born is dismissed in less than a page. The chapters on tuberculosis, rickets, scurvy and congenital syphilis are particularly excellent, while the section on the rheumatic infection in childhood is the most helpful and informative this reviewer has seen. The book is well-bound, printed on fine paper in a very pleasing type and is well arranged for reference. It will prove of interest and value to all practitioners interested in the care of children.

Pædiatrics. Henry Dwight Chapin and Lawrence T. Royster. Seventh edition. Revised and rewritten by Lawrence T. Royster, M.D., Prof. of Pædiatrics, University of Virginia. 775 pages, illustrated. Price $7.00. William Wood, Baltimore, 1933.

The first edition of this work appeared in 1909. The former title, "Diseases of Infants and Children," has been changed with the present volume to the more comprehensive term "Pædiatrics", which the authors consider more descriptive of the contents of the book. The work has been extensively revised, every part of it being altered wherever the authors believed actual knowledge justified a change. The style is clear, direct, concise; the subject-matter brought up to date; the method conservative, with particular stress on the preventive aspect of child-care. One feature of the book calls for special mention. Section One consists of five chapters on Growth and Development. Beginning with fetal development, proceeding through post-natal growth, with emphasis on the varying rhythm of development of the various organs, the psychological as well as physical growth to adolescence is sketched, and the chapter on the Appraisal of the Child concludes this section. The final chapter of the book deals with care of dependent children, the problem of the illegitimate child, and the question of adoption. This book can be recommended to the student who desires his material in concise form, and to the practitioner who wants a compendium of pædiatrics that is at the same time reliable and brief.

Clinical Aspects of the Electrocardiogram. Harold E. B. Pardee, M.D., Associate Professor of Clinical Medicine, Cornell University Medical College. Third edition, 295 pages, illustrated. Price $5.50. Paul B. Hoeber, New York, 1933.

Pardee's pioneer wofk on the electrical changes in coronary thrombosis is well recognised. Since the first edition in 1924 many changes have occurred in the conception of graphic heart study. Insurance companies insist that electrocardiograms accompany applications for policies of moderate size; medical referees state that many of their large claims might have been avoided by information contained in these tracings.

The present edition contains all the accepted new material of the decade. The practitioner will find a lucid chapter on the normal electrocardiogram and the fifteen introductory pages give the interesting story of the development from Einthoven's conception in 1904 and Lewis's experimental and clinical investigation to date. The diagnosis of axis deviation and its significance in determining hypertrophy, the changes due to myocardial diseases, abnormal P and T waves, notching and widening of Q R S, are well treated. The newer conception of the significance of the large Q in the third lead is given. Coronary arteriosclerosis is considered to be present when the Q wave in lead three measures 25 per cent or more of the amplitude of Q R S in any lead.

The chapter on the clinical significance and prognosis of abnormal waves is particularly useful. The criteria for diagnosis of branch bundle block, *i.e.*, wide and notched Q R S and abnormal S T, are studied and well illustrated. The voltage of the Q R S is deemed important, and patients with small Q R S groups usually have a permanent disability.

The significance of disturbance of rate and rhythm forms an important chapter of fifty useful pages. There are the innocuous irregularity of sinus origin, aberrant beats, tachycardias, complete and partial heart block, auricular flutter and fibrillation. Undoubtedly the electrocardiogram is unnecessary for diagnosis of some of these conditions, but in others the information gained is necessary for sure diagnosis.

The effect of digitalis and quinidine in the treatment of auricular fibrillation and flutter is illustrated by graphs. Digitalis may have been just as useful in Withering's time but there is a place for the study of its effect and dosage by electrical methods.

The development of cardiology is well shown by the study of clinical groups, such as valvular disease, irregularity, congenital abnormality, thyroid dysfunction, arteriosclerotic heart disease, etc., and the aid of graphic methods illustrated.

Rœntgenographic Studies of the Urinary System. W. E. Lower, M.D., F.A.C.S., Chief of Department of Urology and B. H. Nichols, M.D., F.A.C.R., Chief of Department of Rœntgenology, Cleveland Clinic, Cleveland. 812 pages, illustrated. Price $18.00. C. V. Mosby Co., St. Louis; McAinsh & Co., Toronto, 1933.

This book, written jointly by a urologist and a roentgenologist, emphasizes the need of close collaboration in diagnostic procedures, necessary in any given field of investigation. The resulting volume is evidence of excellent team-work in one of the best known clinics on this continent, and presents a series of illustrative radiograms covering the common as well as the rarer types of urological problems presenting themselves at

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a large clinic. The text is an illustration of the types of disease in the genito-urinary tract in which the surgeon may expect help from the x-ray department, and provides a series of proved cases with x-ray, clinical, and personal history data which will be an aid in arriving at a diagnosis to those who probably have not had as extensive an experience as the authors. The preliminary chapters supply a carefully worked out technique for the examination of patients whose genito-urinary tract is under suspicion, including preparation of the patient, x-ray technique, and a discussion of findings, followed by a short discussion of types of disease or tumour-formation likely to be found in such examinations.

A special chapter on intravenous urography is introduced. Under the heading of "Indications for the Roentgenographic Examination of the upper right Abdominal Quadrant," a most interesting chapter on differential diagnosis in this area of diagnostic errors is filled with most useful textual information and illustrative radiograms. There are more than 800 illustrations and diagrams—accompanied in each case with concise findings of examinations, and is is evident from reading this book that the authors present only deductions from film examination which can be definitely supported by evidence present in the film. The illustrations are good and these alone make the book valuable as a reference volume.

An Elementary Handbook on Radium and its Clinical Use. D. F. Clephan, Full-time Assistant under the Medical Research Council at Barnato Joel Laboratories, Middlesex Hospital, and H. M. Hill, Radium Officer, Royal Free Hospital. 164 pages, 16 figures. Price $2.25. Oxford University Press, London; McAinsh & Co., Toronto, 1933.

This small volume gives information on radium and its use in a form suitable for nurses and technical assistants who have charge of the preparation and handling of various forms of applicators in which radium is used. A statement is included in the early chapters regarding the discovery of radium, and a summarized statement of our present knowledge regarding radio-active substances other than radium, together with the properties of these various substances. An interesting chapter is included on the history of the development of modern radiotherapy, with a short sketch of the two foremost European clinics, namely Radium Hemmet in Stockholm, and the Institute du Radium in Paris. These are of interest to those not otherwise familiar with the history of these two outstanding institutions. The remainder of the volume is chiefly devoted to a description of the various radium applicators and forms in which radium element and radon are used, and of the technical details governing the methods of handling and the manner in which various types of diseases are treated. Most of this information is brief and written from the standpoint of the nurse or technician rather than the physician who is charged with the immediate clinical application of radium. Within these limitations the small volume is an excellent one of its kind and may be thoroughly recommended.

Physical Therapy. John S. Coulter, M.D., Assistant Professor of Physical Therapy, Northwestern University Medical School, Chicago, Clio Medica Series, no. 8. 142 pages. Price $1.50. Paul B. Hoeber, Inc., New York, 1932.

This little book on Physical Therapy in the Clio Medica Series is really much more than its title would indicate, as it is really a very interesting and entertaining account of the development of medicine from its earliest times. Since much of early therapy centred around the use of physical agents such as massage, exercise, water, light, and electricity, it is particularly informing as to the growth of our knowledge of these agents, even as yet so incompletely known. The amount of information in so small a volume, and yet in so readable a form, is a great credit to the author. The chapter on the growth of our knowledge of electricity as applied to medicine is particularly interesting, giving as it does so clear an understanding of the effect that that mysterious force had on the people at the beginning of the last century. It was apparently the heyday of fakirs, and charlatans, and the operations of the more famous ones are described. Many of the more highly trained men of the day were brought under the spell of this mystifying force and its powers to heal the sick were greatly magnified. It is worthy of note that Benjamin Franklin, much of whose scientific fame is due to his experiments with electricity, stood almost alone in combating the wild claims made for it.

The book has a good bibliography, is well indexed, and should prove a very important addition to the History of Medicine Series.

Workmen's Compensation, Its Medical Aspect. Sir John Collie, C.M.G., D.L., M.D., J.P., Lt.-Col. R.A.M.C., Consulting Medical Officer, Ministry of Pensions. 154 pages. Price $2.25. Edward Arnold, London; Macmillan Co., Toronto, 1933.

In the history of jurisprudence, it has always been the experience that, no matter how clearly and specifically the provisions of a law are set forth by its framers, the administration of that law in later years depends upon the interpretations put upon it by the higher courts in disputed cases. The history of the workmen's compensation legislation of Great Britain is no exception, and we are indebted to Sir John Collie for an exceptionally clear presentation of the judgments which influence the administration of this law. Using the time-honoured method of the legal text-book, illustrating each point by a synopsis of real cases upon which the judgment was based, he sets forth clearly the rights and obligations of all the parties—workman, employer, physician, medical referee. In addition, there is a good deal of valuable material condensed from the author's former book, "Fraud in Medico-Legal Practice," on the methods of examination to disclose fraud and malingering on the part of the workman. At the outset, he rather regrets the wide scope and great expense of workmen's compensation at the present time, and his sympathy is mainly with the employer, who is threatened with loss as a result of malingering on the part of the employee.

It must be remembered, of course, that this work deals with the English law. Many of the legal points of procedure—appeal, right to make examinations and decision on the basis of judgment rendered in previous cases—are not applicable in Canada, where, in most of the provinces, we have taken the matter of compensation for industrial accidents out of the jurisdiction of the civil courts and have put it into the hands of a commission from whose there is no appeal.

The Liver Diet Cookery Book. Compiled by Dorothy Stewart. 62 pages. Price $0.45. John Wright & Sons, Bristol; Macmillan Co., Toronto, 1933.

This book contains recipes for cooking liver without the addition of fat, and gives menus for fourteen days. The book is practical, the author being a sufferer from anæmia. To those who find it almost impossible to serve a high iron diet without giving it a great deal of thought this book will be a boon. The menus are well arranged, but are not suitable for Canada; some of the foods mentioned are not procurable here. Economy in cost has not been studied. The advice given, not to use fish liver is questionable, in view of the satisfactory results reported by McMichael, of Bellevue Hospital, New York.

The Physician as Man of Letters, Science, and Action. Thomas Kirkpatrick Monro, M.A., M.D., Regius Professor of Medicine, University of Glasgow. VIII and 212 pages. Price 10/6. Jackson, Wylie & Co., Glasgow, 1933.

For many years Professor Monro has been collecting data relative to medical men who have distinguished

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themselves in ways other than by the practice of medicine. Deriving his material from almost countless sources, he has manifested great zeal and industry, and has compiled a work that should have great appeal to those of us who are interested in the doings of our confrères. Professor Monro divides his characters roughly into two groups—those who having trained as doctors abandoned the profession for some other pursuit, such as literature, politics, or the stage; and secondly, those who stuck to medicine as a profession or a means of livelihood, and yet earned distinction in other directions. Some of the men he notices were already members of another profession before taking up medicine; such were Thomas Campion and Thomas Phaer, who were lawyers, and Thomas Lodge, who was not only a barrister but a distinguished writer before he turned to physic. Some others who attained to fame for a time pursued medical studies, but never graduated; such were Littré, Sydney Smith, Lessing, John Leech, and Saint Beuve. One is surprised and even fascinated to discover what a wide range of talents our medical confrères have manifested at one time or another. Professor Monro runs over for us the whole gamut, from pirates, like Thomas Dover (of Dover's Powder fame) and Lionel Wafer, and murderers, like Thomas Neill Cream and Hawley Harvey Crippen, to churchmen, like Joannes Aegidius de Sancto Albano, Nicholas de Farnham, Bishop of Durham, and Francis Thomas McDougall, Bishop of Labuan and Sarawak, who is believed by Sir D'Arcy Power to be the only English bishop who attained the F.R.C.S.Eng. by examination, and Popes John XXII, Paul II and Nicolas V, even to saints, like St. Luke, St. Cosmas, St. Damian, and St. Pantaleon. Between these two extremes we have the majority, who have been distinguished for less spectacular achievements in art, music, literature, philosophy, law, war, science and invention, exploration, administration, government, and sport. While most of those noted are British, continental and foreign medical men are not forgotten. Of our Canadians we find the names of Sir William Osler, John McCrae, and William Drummond. No living physicians are included. The book is divided into appropriate chapters in which the various characters are arranged alphabetically. There are two indexes, the first listing the names of those who are the subjects of the biographical notes in the text, and a second, in the main a subject-index, but containing the names of certain who are referred to in a more incidental way. The second index enables a reader who is attracted by any particular subject to complete a list of medical men who were similarly interested.

This book is one of great attractiveness, pleasingly written, and contains a mine of biographical information.

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